

**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION**

**TRAXCELL TECHNOLOGIES, LLC,
Plaintiff,**

**v.
GOOGLE LLC,
Defendant.**

CASE NO. 6:21-cv-00023

JURY DEMAND

PLAINTIFF’S ORIGINAL COMPLAINT FOR PATENT INFRINGEMENT

Traxcell Technologies, LLC. (“Traxcell”) files this Original Complaint, and demand for jury trial seeking relief from patent infringement by Google LLC (“Defendant” or “Google”), alleging infringement of the claims of U.S. Pat. No. 9,918,196, U.S. Pat. No. 9,549,388, and U.S. Pat. No. 10,820,147 (collectively referred to as “Patents-in-Suit”), as follows:

I. THE PARTIES

1. Plaintiff Traxcell is a Texas Limited Liability Company, with its principal place of business located at 103 Country Club Drive. #508, Marshall, Texas 75672.

2. Defendant Google LLC is a Delaware corporation with a principal place of business located at 1600 Amphitheater Parkway, Mountain View, California 94043. Google designs, manufactures, uses, imports into the United States, sells, and/or offers for sale in the United States smartphones, tablets, iPods, desktop computers, and notebook computers that use Google Maps. Google markets, sells, and offers to sell its products and/or services, including those accused herein of infringement, to actual and potential customers and end-users located in Texas and in the judicial Western District of Texas such as at the Google maintains a permanent physical presence within the Western District of Texas, conducting business from at least its locations at: 9606 North Mo-Pac Expressway, Suite 700, Austin, Texas 78759; 500 West 2nd Street, Suite 2000, Austin, Texas

78701; 4100 Smith School Road, Austin, Texas 78744; as well as other locations in and around the Austin area.

3. Google is registered to do business in Texas and can be served via its registered agent, Corporation Service Company dba CSC – Lawyers Incorporating Service Company at 211 East 7th Street, Suite 620, Austin, Texas 78701-3218.

4. Google has placed or contributed to placing infringing products like the Google Maps for use on a computing device connected to a wireless network into the stream of commerce via an established distribution channel knowing or understanding that such products would be sold and used in the United States, including in the Western District of Texas. On information and belief, Google also has derived substantial revenues from infringing acts, including but not limited to advertising, business APIs, private usage, OEM usage, and/or the like.

II. JURISDICTION AND VENUE

5. This is an action for patent infringement arising under the patent laws of the U.S., 35 U.S.C. §§ 1 et. seq. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331, 1332(a) and 1338(a).
6. This Court has personal jurisdiction over Defendants because: Defendants are present within or has minimum contacts within the State of Texas and this judicial district; Defendants have purposefully availed itself of the privileges of conducting business in the State of Texas and in this judicial district; Defendants regularly conducts business within the State of Texas and within this judicial district; and Plaintiff's cause of action arises directly from Defendants' business contacts and other activities in the State of Texas and in this judicial district. The amount in controversy is more than \$75,000.00.

7. Venue is proper in this judicial district per 28 U.S.C. §§ 1391 and 1400(b). Google has committed acts of infringement in this judicial district and maintains regular and established places of business in this district, as set forth above. Google has continuous and systematic business contacts with the State of Texas. Google, directly or through subsidiaries or intermediaries (including distributors, retailers, contract manufacturers, and others), conducts its business extensively throughout Texas, by shipping, manufacturing, distributing, offering for sale, selling, and advertising (including the provision of interactive web pages) its products and services in the State of Texas and the Western District of Texas. Google, directly or through subsidiaries or intermediaries (including distributors, retailers, contract manufacturers, and others), has purposefully and voluntarily placed its infringing products and services into this District and into the stream of commerce with the intention and expectation that they will be purchased and used by consumers in this District.

III. INFRINGEMENT ('196 Patent (attached as Exhibit A))

8. On March 13, 2018, U.S. Patent No. 9,918,196 (“the ’196 patent”), attached as Exhibit A, entitled “Internet queried directional navigation system with mobile and fixed originating location determination” was duly and legally issued by the U.S. Patent and Trademark Office. Traxcell owns the ’196 patent by assignment.
9. The ’196 Patent’s Abstract states, “A mobile wireless network and a method of operation provide directional assistance in response to an Internet query. The directional assistance is provided from a location of the querying device to a destination that may be selectively prompted based on whether the destination is a nearby business, a type of business, a street address, or another mobile device or fixed telephone location. The location of the querying

device is also selectively determined depending on whether the querying device is a wireless device such as a mobile telephone, or whether the device has a presumed fixed location, such as an ordinary telephone connected to a public-switched telephone network (PSTN).

10. The following preliminary exemplary chart provides notice of Traxcell's allegations of infringement.

Exemplary Claim	Corresponding Structure in Accused Systems
<p>A method of providing navigation assistance to a user of a communications device, the method comprising:</p>	<p>The Google Maps online navigation service and the Google Maps server-side or cloud infrastructure needed to provide the service, constitute the "Accused System".</p> <p>The term "Google Maps" encompasses and includes all the versions and variants of the Google Maps web (for PC) and the Google Maps app (Google Maps app for Android and iOS devices) and the applications supported by the Google Maps Platform.</p> <p>The "method of providing navigation assistance to a user of a communications device" refers to the method by which Google Maps provides online navigation assistance (directions) to a user of a communications device or UE (example: mobile phone, smartphone, laptop, tablet, iPhone, iPad etc.) including the Google Maps app or including a browser plugin enabling access to the Google Maps website or having other means to access the Google Maps website, for querying and receiving navigation instructions for travelling from a starting location (current location of the communications device or a location specified by its user as the 'origin') to a destination location (a location specified by the said user as the 'destination').</p> <p>The "communications device" refers to a UE (example: mobile phone, smartphone, laptop, tablet, iPhone, iPad etc.) including the Google Maps app or including a browser plugin enabling access to the Google Maps website or having other means to access the Google Maps website for querying and receiving navigation instructions for travelling from a starting location (current location of the communications device or a location specified by its user as the 'origin') to a destination location (a location specified by the said user as the 'destination').</p>

Exemplary Claim	Corresponding Structure in Accused Systems
	<p>The said “communications device” (the user of the said “communications device”) is device of including but not limited to Verizon, T-Mobile, Sprint, SPRINT, Nokia, and the other United States communications device provider.</p> <p>Verizon, T-Mobile, Sprint, supports the Google Maps online navigation service on devices that are subscribed to wireless telecommunications network services of the Verizon, T-Mobile, Sprint, SPRINT, Nokia or any other united states carrier. Verizon, T-Mobile, SPRINT, etc. provides the mobile data service required to use the Google Maps online navigation service.</p> <p>Google Maps provides navigation assistance (directions) to a “user of a communications device” for travelling from a starting location (Ex: Starbucks, 13-25 Astor Pl, New York, NY 10003, USA) to a destination location (Ex: Central Park South, New York, NY, USA).</p>
<p>receiving, by a directional assistance service, an Internet query initiated at the communications device and directed via the Internet to initiate a request for navigational assistance to a destination;</p>	<p>Navigation using Google Maps online navigation service is a well-known example of off board navigation. To elaborate, an off board navigation system is a client/server system wherein only the user interface (UI) resides on the client’s (user’s) communications device and all the databases (GIS and/or mapping) and infrastructure required for computation (of route, distance, travel time, traffic etc.) reside remotely on a server or a network of servers (the server-side) located on the world wide web (www). The server-side could also comprise virtual (instead of physical) or cloud server infrastructure. The client side (user interface or UI at a user’s communications device) can only communicate with the server-side via the Internet.</p> <p>This claim element refers to the method and process involved in initiating a navigation query, using Google Maps online navigation service, to obtain directions (navigation assistance) for travelling from a starting location to a destination location. The process involved in initiating the said navigation query includes inputting a destination location at the Google Maps’ user interface (UI) at the user’s communications device, and sending the said query via Internet to the remote Google Maps server (cloud server). The said remote Google Maps server (cloud server) receives the said query via Internet.</p> <p>The term “directional assistance service” herein refers to Google Maps online navigation service supported and facilitated by wireless telecommunications network of the Verizon, T-Mobile, Sprint, SPRINT, Nokia or any other united states carrier.</p>

Exemplary Claim	Corresponding Structure in Accused Systems
	<p>The “communications device” refers to a UE (example: mobile phone, smartphone, laptop, tablet, iPhone, iPad etc.) including the Google Maps app or including a browser plugin enabling access to the Google Maps website or having other means to access the Google Maps website, for querying and receiving navigation instructions for travelling from a starting location (current location of the communications device or a location specified by its user as the ‘origin’) to a destination location (a location specified by the said user as the ‘destination’).</p> <p>The method of using the Google Maps for navigation includes initiating a query at the communications device to initiate a request for navigational assistance for travelling from a starting point (which could be the current location of the user’s communications device) to a destination, by specifying (inputting) the destination and the starting point (if different from the current location of the user’s communications device).</p> <p>The said query is directed via the Internet to the remote Google Maps server (cloud server). In other words, the Google Maps server (cloud server) receives the said query through the Internet. Google Maps online navigation is an example of off board navigation. In other words, Google Maps online navigation system is a client/server system wherein only the user interface (UI) resides on the client’s (user’s) communications device and all the databases (GIS and/or mapping) and infrastructure required for computation (of route, distance, travel time, traffic etc.) reside remotely on a Google Maps server or a network of servers (the server-side) located on the world wide web (www). The server-side could also comprise virtual (instead of physical) or cloud server infrastructure. The client side (user interface or UI at a user’s communications device) can only communicate with the server-side via the Internet. In other words, destination is input and a query is initiation at the Google Maps user interface (UI) at the client device and the query (including the input destination) is communicated from the client-side (client or user’s communications device) to the remote server-side (Google Maps server) via the Internet. The Google Maps server, upon receiving the query (including the input destination) communicated from the client-side (client or user’s communications device) via the Internet, identifies the required map tiles (or grid squares), computes or calculates the route(s), and downloads the required map tiles (or grid squares) and the computed or calculated route(s) to the client-side (client or user’s communications device) via the Internet.</p> <p>The aforementioned fact that Google Maps online navigation is an example of off-board navigation is established from the following details available in the public domain –</p> <p>a) In Attachment 8, which is a copy of information on off-board navigation available on the Wikipedia, Google Maps (online navigation) is cited as an example of off-board navigation system. The following is mentioned therein –</p>

Exemplary Claim	Corresponding Structure in Accused Systems
	<p>“In addition to navigation software, there are also route planner as offboard solution. The difference to the conventional route planning in the Internet is the possibility of the location transmission of the user. Google Maps offers such a mobile route planner with the Google Maps Mobile software.”</p> <p>Attachment 8 also elaborates on and describes off-board navigation. The following is mentioned therein –</p> <p>“The offboard navigation allows the use of a mobile phone as a navigation system, with the route data and maps not stored on the device. Using special navigation software, the user contacts an external server via UMTS or GPRS and downloads the desired route information and maps from there. In everyday language, off-board navigation is also called "mobile phone navigation".</p> <p>“The difference between offboard navigation and onboard navigation: In the case of onboard navigation, the route data and maps are stored together with navigation software in the mobile device. This requires a lot of storage space, so onboard navigation is only suitable for devices with a larger processor and more storage space, such as PDAs and smartphones. For offboard navigation, however, are now many popular mobile phones with Java operating system (J2ME). A prerequisite for offboard navigation is that the mobile phone can connect to the Internet via UMTS or GPRS. Both variants require GPS reception. It must therefore have an integrated or an externally connected GPS receiver (GPS mouse). If an external GPS receiver is used, the two devices are now usually coupled together via Bluetooth.”</p> <p>b) In Attachment 9, which is a copy of information on Google Maps navigation available on the Wikipedia, Google Maps (online navigation) is described as an off-board navigation system, which subsequent to receiving a destination input at the client-side user interface (UI) obtains map and route information (from its server) via the Internet. The following is mentioned therein –</p> <p>“Google Maps Navigation is a mobile application developed by Google for the Android and iOS operating systems that was later integrated into the Google Maps mobile app. The application uses an Internet connection to a GPS navigation system to provide turn-by-turn voice-guided instructions on how to arrive at a given destination. The application requires connection to Internet data (e.g. 3G, 4G, WiFi, etc.) and normally uses a GPS satellite connection to determine its location. A user can enter a destination into the application, which will plot a path to it. The app displays the user's progress along the route and issues instructions for each turn.”</p>

Exemplary Claim	Corresponding Structure in Accused Systems
	<p>“Once the user has searched for a destination, the map will cache along the intended route. Note that the application requires an Internet connection to search for the route, but once a route has been found, the user no longer requires an Internet connection as the route is temporarily saved onto the device.”</p> <p>c) In Attachment 10, which is a copy of information on Google Maps available on the Wikipedia, Google Maps (online navigation) is described as an off-board navigation system, wherein subsequent to inputting a destination input at the client-side user interface (UI) map tiles (or grid squares) are downloaded to the client-side (user’s communications device) from the remote Google Maps server via the Internet. The following is mentioned therein –</p> <p>“As the user drags the map, the grid squares are downloaded from the server and inserted into the page. When a user searches for a business, the results are downloaded in the background for insertion into the side panel and map; the page is not reloaded.”</p> <p>d) Attachment 11 describes Google Maps (online navigation) as an online and off board navigation system, which upon destination input and query initiation at the UI at the client device, downloads maps to the client device from its remote server via Internet. Attachment 11 also elaborates on and describes a typical “online/off board navigation system”.</p> <p>The following is mentioned therein –</p> <p>“Navigation online / offboard This refers to a navigation solution that does not store your maps in the internal memory of the smartphone or on its SD card, but during use continuously from a server on the Internet. Thus, a continuous, wideband broadband Internet connection (UMTS, HSDPA, in the future also LTE) during the navigation is mandatory requirement.</p> <p>Benefits of this online solution: You do not have to worry about map updates, but always automatically use the most up-to-date maps available. In addition, the two most popular online navigation solutions for Android are free: Skobbler from a Berlin company and the well-known Google Maps Navigation.”</p> <p>Attachment 11 also mentions the amount of data Google Maps (online navigation) requires. The following is mentioned therein –</p>

Exemplary Claim	Corresponding Structure in Accused Systems
	<p>“However, these free online solutions certainly have disadvantages: they cause considerable data traffic between the server of the navigation solution provider and your smartphone. If you only select the map view on Google Maps, you can significantly reduce the traffic: A 55-kilometer route caused only 1 MB of traffic in Google Maps Navigation in the map view. In the satellite view, it was on the same route 11 MB of traffic!”</p> <p>“And of course, an online solution requires a good internet connection. So, if you're often away from metropolitan areas in areas with poor data connectivity and therefore usually surf at edge speeds, then you should opt for an onboard solution. However, the use of Google Maps Navigation worked well with Edge, if you do not unnecessarily increase the resulting traffic. Therefore, our tip: With an online navigation solution like Google Maps Navigation, you should do without the satellite view and only choose the map view if the internet connection is poor and / or the monthly traffic limit is low.”</p> <p>e) Attachment 12 describes Google Maps (online navigation) as an off board navigation system, which upon destination input and query initiation at the UI at the client device, downloads maps to the client device from its remote server via Internet. The following is mentioned therein – “Using GPS and mobile network, Google Maps locates you with astonishing precision. If you are looking for restaurants, petrol stations or ATMs, you will not only get the corresponding contact details and the position on the map, but you can also be directed there directly. With Google Map you always check your current position and find the best route to your desired destination. Who wants to use the free navigation frequently, should get an internet flat rate, as Google Maps pulls the map data from the Internet (Offboard- Navigation).”</p> <p>f) Attachment 4 indicates that Google Maps (online navigation) is an off board navigation system, which upon destination input and query initiation at the UI at the client device, downloads maps to the client device from its remote server via Internet. It also confirms that wireless telecommunications network (T-Mobile, Verizon, SPRINT, etc.) provides the mobile data service required to use the Google Maps online navigation service. The following is mentioned therein –</p> <p>“Google maps has offline maps feature save mobile data. Global Positioning Service - GPS is provided free of cost by satellite everywhere. Data will be used to get maps on the go with T Mobile, Verizon, Sprint, Airtel, Vodafone.”</p> <p>“Google maps app is FREE to use but they do need area maps to be downloaded. Google maps allows offline or without internet access of their maps, if you have downloaded them earlier on your mobile.”</p>

Exemplary Claim	Corresponding Structure in Accused Systems
	<p>“If not downloaded, and you use Google maps to find directions using your own FREE GPS receiver (installed in your smartphone) using your mobile internet connection to get maps on the go and show you directions.”</p> <p>“Remember, Google maps (if maps not already available) would need the internet connection and would incur internet data charges in roaming.”</p> <p>So, based on the foregoing information it is established that navigation using Google Maps online navigation service is an example of off board navigation. As we have learnt, an off board navigation system is a client/server system wherein only the user interface (UI) resides on the client’s (user’s) communications device and all the databases (GIS and/or mapping) and infrastructure required for computation (of route, distance, travel time, traffic etc.) reside remotely on a server or a network of servers (the server-side) located on the world wide web (www). The server-side could also comprise virtual (instead of physical) or cloud server infrastructure. The client side (user interface or UI at a user’s communications device) can only communicate with the server-side via the Internet. In other words, destination is input and a query is initiation at the Google Maps user interface (UI) at the client device and the query (including the input destination) is communicated from the client-side (client or user’s communications device) to the remote server-side (Google Maps server) via the Internet. The Google Maps server, upon receiving the query (including the input destination) communicated from the client-side (client or user’s communications device) via the Internet, identifies the required map tiles (or grid squares), computes or calculates the route(s), and downloads the required map tiles (or grid squares) and the computed or calculated route(s) to the client-side (client or user’s communications device) via the Internet.</p> <p>The said query is communicated from the Google Maps’ client-side to the Google Maps server in the form of a URL</p> <p>The method of using the Google Maps for navigation includes initiating a query at the communications device to initiate a request for navigational assistance for travelling from a starting point (which could be the current location of the user’s communications device) to a destination, by specifying (inputting) the destination and the starting point (if different from the current location of the user’s communications device).</p> <p>The said query is directed via the Internet to the remote Google Maps server (cloud server). In other words, the Google Maps server (cloud server) receives the said query through the Internet.</p>

Exemplary Claim	Corresponding Structure in Accused Systems
<p>responsive to receiving the Internet query, determining whether or not the communications device is a mobile wireless communications device;</p>	<p>Google Maps is programmed to identify the “phone type” (or device type) and the “unique identifier” of the communications device (UE) at which the said navigation query is initiated. In other words, Google Maps determines whether or not the said communications device (UE) is a mobile wireless communications device (UE).</p> <p>“a mobile wireless communications device” refers to a mobile wireless communications device or UE (example: mobile phone, smartphone, laptop, tablet, iPhone, iPad etc.), which includes the Google Maps app or includes a browser plugin enabling access to the Google Maps website or has other means to access the Google Maps website for querying and receiving navigation instructions for travelling from a starting point (current location of the communication’s device or a location specified by its user as the ‘origin’) to a destination location (a location specified by the said user as the ‘destination’).</p> <p>In Attachment 20, Google Privacy Policy document, it is clearly mentioned that Google (Google Maps) collects information such as device type, phone number and unique identifiers pertaining to the communications device (UE) at which a navigation query is initiated and communicated to the Google Maps server. In other words, Google Maps has means to determine whether a querying communications device (UE) is a mobile wireless communications device (UE) or not.</p> <p>The following is mentioned therein –</p> <p>“Information we collect as you use our services</p> <p>From the aforementioned, it is also confirmed that whenever a communications device uses Google Maps, information such as mobile network information including name of the carrier serving the said communications device are collected by Google (Google Maps). In other words, Google Maps can also ascertain whether the communications device (UE) at which the said navigation query is initiated, is connected to the Google Maps server through a wireless telecommunications network service (i.e. through RF signal-based communication) or through a Wi-Fi network supported by a fixed-line or wired broadband Internet service.</p> <p>A copy of the Google Play webpage displaying information on Google Maps app updated on November 8, 2018, it is clearly mentioned that the Google Maps app has access to Phone, Device ID and Call information pertaining to the device on which it is installed, and it can read “phone status and identity”. In other words, Google Maps has means to determine whether a querying communications device (UE) is a mobile wireless communications device (UE) or not.</p> <p>Google Maps app installed on a communications device can “view Wi-Fi connections” and can “view network connections” pertaining to the said communications device.</p>

Exemplary Claim	Corresponding Structure in Accused Systems
	<p>In other words, Google Maps can also ascertain whether the communications device (UE) at which the said navigation query is initiated, is connected to the Google Maps server through a wireless telecommunications network service (i.e. through RF signal-based communication) or through a Wi-Fi network supported by a fixed-line or wired broadband Internet service.</p> <p>In summary, Google Maps has means to determine whether a querying communications device (UE) is a mobile wireless communications device (UE) or not, and also whether the said communications device (UE) is connected to the Google Maps server through a wireless telecommunications network service (i.e. through RF signal-based communication) or through a Wi-Fi network supported by a fixed-line or wired broadband Internet service.</p>
<p>responsive to determining that the communications device is the mobile wireless communications device, the directional assistance service determining and using a present location of the mobile wireless communications device as a location of the communications device;</p>	<p>If the Google Maps online navigation service determines that the said navigation query has been initiated at a mobile wireless communications device (UE), and that the said query was communicated through a wireless telecommunications network service (i.e. through RF signal-based communication), Google Maps determines current location of the mobile wireless communications device (UE) and uses it as the starting point for providing navigation information (instructions or directions) to travel to the destination input by the user of the said communications device (UE).</p> <p>The “the mobile wireless communications device” or the “communications device” refers to the mobile wireless communications device or UE (example: mobile phone, smartphone, laptop, tablet, iPhone, iPad etc.) at which the navigation query was initiated.</p> <p>A user can simply input a “destination” entry and initiate a navigation query on the Google Maps’ client-side user interface (UI) at the user’s mobile wireless communications device (Google Maps app on an Android smartphone). The Google Maps server, upon receiving the navigation query (including input “destination”) from the client-side via Internet, determines the “current location” of the user’s mobile wireless communications device, uses it as the default starting point, ascertains the location of the input “destination”, computes or calculates the route(s) and directions, and downloads the computed or calculated route(s) and directions to the user’s mobile wireless communications device.</p> <p>A user can simply input a “destination” entry and initiate a navigation query on the Google Maps’ client-side user interface (UI) at the user’s mobile wireless communications device (Google Maps app on an Android smartphone). The Google Maps server, upon receiving the navigation query (including input “destination”) from the client-side via Internet, determines the “current location” of the user’s mobile wireless communications device, uses it as the default starting point, ascertains the location of the input “destination”, computes or calculates the</p>

Exemplary Claim	Corresponding Structure in Accused Systems
	<p>route(s) and directions, and downloads the computed or calculated route(s) and directions to the user's mobile wireless communications device.</p> <p>As has been mentioned with reference to the previous claim element, Google Maps, upon receiving a navigation query from a user's communications device, determines whether or not the said communications device is a mobile wireless communications device.</p> <p>Aa user can simply input a "destination" entry and initiate a navigation query on the Google Maps' client-side user interface (UI) at the user's mobile wireless communications device (Google Maps app on a smartphone). Implying that the Google Maps server, upon receiving the navigation query (including input "destination") from the client-side via Internet, determines the "current location" of the user's mobile wireless communications device, uses it as the default starting point, ascertains the location of the input "destination", computes or calculates the route(s) and directions, and downloads the computed or calculated route(s) and directions to the user's mobile wireless communications device.</p> <p>A user can simply input a "destination" entry and initiate a navigation query on the Google Maps' client-side user interface (UI) at the user's mobile wireless communications device (Google Maps app on an Android phone or tablet). The Google Maps server, upon receiving the navigation query (including input "destination") from the client-side via Internet, determines the "current location" of the user's mobile wireless communications device, uses it as the default starting point, ascertains the location of the input "destination", computes or calculates the route(s) and directions, and downloads the computed or calculated route(s) and directions to the user's mobile wireless communications device.</p>
<p>responsive to determining that the communications device is not the mobile wireless communications device, obtaining a fixed location associated with the communications device to determine the location of the</p>	<p>As mentioned previously, Google Maps is programmed to identify the "phone type" (or device type) of the communications device (UE) at which the said navigation query is initiated, and also to ascertain whether the communications device (UE) at which the said navigation query is initiated, is connected to the Google Maps server through a wireless telecommunications network service (i.e. through RF signal-based communication) or through a Wi-Fi network supported by a fixed-line or wired broadband Internet service.</p> <p>In other words, Google Maps has means to determine whether a querying communications device (UE) is a mobile wireless communications device (UE) or not, and also whether the said communications device (UE) is connected to the Google Maps server through a wireless telecommunications network service (i.e. through RF signal-based communication) or through a Wi-Fi network supported by a fixed-line or wired broadband Internet service.</p>

Exemplary Claim	Corresponding Structure in Accused Systems
communications device; and	In the Google Privacy Policy document, it is clearly mentioned that Google (Google Maps) collects information such as device type, phone number and unique identifiers pertaining to the communications device (UE) at which a navigation query is initiated and communicated to the Google Maps server. In other words, Google Maps has means to determine whether a querying communications device (UE) is a mobile wireless communications device (UE) or not. The following is mentioned therein:
the directional assistance service providing navigation information to the communications device in response to the Internet query, wherein the navigation provides directions for proceeding from the location of the communications device to a location of the destination.	<p>In response to receiving the navigation query (which includes the “destination” entry input by the user at the Google Maps client-side user interface or UI residing at the user’s communications device) initiated at the communications device (UE) and directed via the Internet, Google Maps server determines the current location of the querying (the user’s) communications device, considers it the default starting point, ascertains the location of the input “destination”, computes and provides the navigation information (directions) to the said communications device (UE) to travel from the current location of said communications device (UE) to the input destination.</p> <p>A user can simply input a “destination” entry and initiate a navigation query on the Google Maps’ client-side user interface (UI) at the user’s mobile wireless communications device (Google Maps app on an Android smartphone). The Google Maps server, upon receiving the navigation query (including input “destination”) from the client-side via Internet, determines the “current location” of the user’s mobile wireless communications device, uses it as the default starting point, ascertains the location of the input “destination”, computes or calculates the route(s), and downloads the computed or calculated route(s) to the user’s mobile wireless communications device. In this manner, Google Maps provides the navigation information (directions) to the said communications device (UE) to travel from the current location of said communications device (UE) to the input destination.</p> <p>A user can simply input a “destination” entry and initiate a navigation query on the Google Maps’ client-side user interface (UI) at the user’s mobile wireless communications device (Google Maps app on an Android smartphone). The Google Maps server, upon receiving the navigation query (including input “destination”) from the client-side via Internet, determines the “current location” of the user’s mobile wireless communications device, uses it as the default starting point, ascertains the location of the input “destination”, computes or calculates the route(s), and downloads the computed or calculated route(s) to the user’s mobile wireless communications device. In this manner, Google Maps provides the navigation information (directions) to the said communications device (UE) to travel from the current location of said communications device (UE) to the input destination.</p>

11. Defendant makes, uses, offers to sell, and/or sells within or imports into the wireless-network components, related applications and programs, and related services that use identified locations of wireless devices to provide directional assistance such that

Defendant infringes claims 1–30 of the '196 patent, literally or under the doctrine of equivalents.

12. Defendant put the inventions claimed by the '196 Patent into service (i.e., used them); but for Defendant's actions, the claimed-inventions embodiments involving Defendant's products and services would never have been put into service. Defendant's acts complained of herein caused those claimed-invention embodiments as a whole to perform, and Defendant obtaining monetary and commercial benefit from it.
13. Defendant has and continues to induce infringement. Defendants have actively encouraged or instructed others (e.g., its customers, such as Verizon, T-Mobile and Sprint), and continues to do so, on how to use its products and services (e.g., wireless-network components and related applications and programs that use identified locations of wireless devices to provide directional assistance) such to cause infringement claims 1–30 of the '196 patent, literally or under the doctrine of equivalents. Moreover, Defendant has known and should have known of the '196 patent, by at least by the date of the patent's issuance, or from the issuance of the '284 patent, which followed the date that the patent's underlying application was cited to Defendants by the U.S. Patent and Trademark Office during prosecution of one of Defendant's patent applications, such that Defendant knew and should have known that it was and would be inducing infringement.
14. Defendant has and continues to contributorily infringe. Defendant has actively encouraged or instructed others (e.g., its customers and/or the customers of its related companies, such as Verizon, T-Mobile and Sprint), and continues to do so, on how to use its products and services e.g., wireless-network components and related applications and programs that use identified locations of wireless devices to provide directional assistance) such as to cause

infringement of one or more of claims 1–30 of the '196 patent, literally or under the doctrine of equivalents. Moreover, Defendant has known of the '196 patent and the technology underlying it from at least the date of issuance of the patent or from the issuance of the '284 patent, which followed the date that the patent's underlying application was cited to Defendants by the U.S. Patent and Trademark Office during prosecution of one of Defendant's patent applications, such that Defendant knew and should have known that it was and would be contributorily infringing.

15. Defendants have caused and will continue to cause Traxcell damage by infringing the '196 patent.

IV. INFRINGEMENT ('388 Patent (Attached as exhibit B))

16. On January 17, 2017, U.S. Patent No. 9,549,388 ("the '388 patent") entitled "Mobile wireless device providing off-line and on-line geographic navigation information" (attached as Exhibit D) was duly and legally issued by the U.S. Patent and Trademark Office. Traxcell owns the '388 patent by assignment.

17. The '388 Patent's Abstract states, "A mobile device, wireless network and their method of operation provide both on-line (connected) navigation operation, as well as off-line navigation from a local database within the mobile device. Routing according to the navigation system can be controlled by traffic congestion measurements made by the wireless network that allow the navigation system to select the optimum route based on expected trip duration."

18. The following preliminary exemplary chat provides Traxcell's allegations of infringement.

Exemplary Claim	Corresponding Structure in Accused Systems
A wireless communications system including:	The Google Maps online navigation service and the Google Maps server-side or cloud infrastructure needed to provide the service, constitute the “Accused System”.
a first radio-frequency transceiver within a wireless mobile communications device and an associated first antenna to which the first radio-frequency transceiver is coupled, wherein the first radio-frequency transceiver is configured for radio-frequency communication with a wireless communications network;	<p>When a wireless communication device transceivers and antennas are in communication, they are coupled. Further, in addition to being so coupled, the transceiver of each Exhibit-B item is also configured for RF-communication wireless communication networks, such as AT&T, Verizon, T-Mobile, and other US networks (Cellular or WLAN) via Google Maps which comes preloaded on Exhibit-B items.</p> <p>Wireless mobile communication device — including but not limited to Google’s branded devices</p> <p>such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc.— include radio-frequency transceivers and an associated antenna. When wireless communication device transceivers and antennas are in communication, they are coupled. Further, in addition to being so coupled, the transceiver of each is also configured for RF-communication with the wireless communication network.</p>
a first processor within the wireless mobile communications device coupled to the at least one first radio-frequency transceiver	<p>Wireless mobile communication device- including but not limited to Google’s branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list) has a processor, for example, Quad-Core/ Octa-core processor.</p> <p>Each Exhibit-B-listed mobile wireless communications device’s motherboard processor is programmed to process location-service information; i.e., to receive a location of the device from the wireless communications network (which is communicated to the device from the first RF transceiver) and generate an indication of the device’s location with respect to geographic features according to mapping information stored within the device.</p>

Exemplary Claim	Corresponding Structure in Accused Systems
	<p>For example, the motherboard processor may use Google Maps to view and find places around the globe. The processor and base station transceivers communicate by RF communication and, thus, when doing so are communicatively coupled.</p>
<p>programmed to receive a location of the wireless mobile communications device from the wireless communications network and generate an indication of a location of the wireless mobile communications device with respect to geographic features</p>	<p>Plaintiff contends the Exhibit-B-listed mobile-wireless-communications device's motherboard processor is programmed to process location-service information; i.e., to receive a location of the device from the wireless communications network and generate an indication of the device's location.</p> <p>For example, the motherboard processor may use Google Maps to obtain the device's location and provide direction from that location to a destination. Wireless mobile communication device- including but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. has a processor for example, Quad-Core processor. When wireless communication device transceivers and processor are in communication, they are coupled. Further, the Location-based Service (LBS) provider, such as Google Map, on the Exhibit-B utilizes the processor coupled to the transceiver to estimates/receive the location on mobile wireless communications devices by utilizing wireless communication network or first computer.</p> <p>For example, the motherboard processor may use Google Maps to view and find places around the globe. Google map can also show your current location and provide direction (including with respect to geographic features such as nearby restaurants) from your location/source to any destination. In using Google Maps App, the mobile wireless communication device's motherboard processor generates signals for displaying on the device's screen a blue dot that shows the current location of the wireless mobile communication device. The Google map app estimates the location of the device from 3 sources: GPS (GPS uses satellites and knows your location within a few meters), Wi-Fi (the location of nearby Wi-Fi networks helps Maps know where you are), and cell towers (cell tower can be accurate up to a few thousand meters). When Google Maps isn't sure about your location, a light blue circle around the blue dot is shown. You might be anywhere within the light blue circle. The smaller the circle, the more certain the app is about your location.</p> <p>Furthermore, Google Maps App provides flexibility to download maps on SD card/internal memory of communication device examples of compatible devices is</p>

Exemplary Claim	Corresponding Structure in Accused Systems
	<p>Samsung Galaxy S20, Pixel 4a, Pixel 4a 5G, Pixel 5, etc., and navigate offline. When internet is slow or mobile data is expensive, or communication device cannot connect to internet, an area can be saved to phone or tablet (Exhibit B) from Google maps app and use it when offline. Communication device can use Offline maps for Navigation through the downloaded area without internet.</p>
<p>according to mapping information stored within the wireless mobile communications device, and</p>	<p>Plaintiff contends Google's and others mobile-wireless-communications device's motherboard processor is programmed to process location-service information; i.e., to receive a location of the device from the wireless communications network and generate an indication of the device's location.</p> <p>For example, the motherboard processor may use Google Maps to obtain the device's location and provide direction from that location to a destination. Wireless mobile communication device- including but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list) has a processor for example, Quad-Core processor. When wireless communication device transceivers and processor are in communication, they are coupled. Further, the Location-based Service (LBS) provider, such as Google Map, on the Exhibit-B utilizes the processor coupled to the transceiver to estimates/receive the location on mobile wireless communications devices by utilizing wireless communication network or first computer.</p> <p>For example, the motherboard processor may use Google Maps to view and find places around the globe. Google map can also show your current location and provide direction (including with respect to geographic features such as nearby restaurants) from your location/source to any destination. In using Google Maps App, the mobile wireless communication device's motherboard processor generates signals for displaying on the device's screen a blue dot that shows the current location of the wireless mobile communication device. The Google map app estimates the location of the device from 3 sources: GPS (GPS uses satellites and knows your location within a few meters), Wi-Fi (the location of nearby Wi-Fi networks helps Maps know where you are), and cell towers</p>

Exemplary Claim	Corresponding Structure in Accused Systems
	<p>(cell tower can be accurate up to a few thousand meters). When Google Maps isn't sure about your location, a light blue circle around the blue dot is shown. You might be anywhere within the light blue circle. The smaller the circle, the more certain the app is about your location.</p> <p>Furthermore, Plaintiff contends Google Maps App provides flexibility to download maps on SD card/internal memory of communication device examples of compatible devices is Samsung Galaxy S20, Pixel 4a, Pixel 4a 5G, Pixel 5, etc., and navigate offline. When internet is slow or mobile data is expensive, or communication device cannot connect to internet, an area can be saved to phone or tablet from Google maps app and use it when offline. Communication device can use Offline maps for Navigation through the downloaded area without internet.</p>
<p>wherein the processor displays to the user navigation information according to the location of the wireless mobile communications device with respect to the geographic features and a destination specified by the user at the wireless mobile communications device;</p>	<p>Plaintiff contends the motherboard processor (i.e., processor on the motherboard) of each wireless communication device item</p> <p>meets this limitation. The processor processes location-service information, including displaying user navigation information according to the device's location with regards to geographic features and a user-specified</p> <p>destination. For example, using Google map app for more examples of location services processed by each Exhibit-B device's motherboard processor) the device user locates the device's current location on the google map app and then provide details for</p> <p>a destination on the options, provided in the Google map app. The user can then navigate (i.e., the processor processes display information) in real time from current location to destination. The processor displays navigation in the Google Maps app to display turn-by-turn directions. Using the Google map app, the processor will show the directions and use real-time traffic information to find the best route to the specified destination.</p>

Exemplary Claim	Corresponding Structure in Accused Systems
<p>at least one second radio-frequency transceiver and an associated at least one second antenna of the wireless communications network to which the second radio-frequency transceiver is coupled; and</p>	<p>Plaintiff contends each Accused System includes a base station and each of which is coupled to at least one antenna. Base station includes radio-frequency transceivers designed and used for radio-frequency communication with at least one antenna. When base-station transceivers and antennas are in communication, they are coupled. Further, in addition to being so coupled, the transceivers and antenna of each Exhibit-A item are also, by placement within a base station, physically coupled.</p> <p>The cell of the wireless communications network include base stations for transmission and reception of wireless signals to and from the mobile wireless communication devices or UEs or user devices (mobile phones, laptops, tablets, PDAs etc.). These base stations are, therefore, RF transceivers. Also, these base stations are coupled with at least one antenna for the function of transmission and reception.</p>
<p>a second processor coupled to the at least one second radio-frequency transceiver programmed to determine the location of the wireless mobile communications device,</p>	<p>Plaintiff contends that Google Maps has one or more processors that determine(s) the location of wireless mobile communications devices. These processors communicatively coupled to the second RF transceiver(s) and are programmed to determine a wireless mobile communication device's location.</p> <p>Wireless mobile communications devices can, through the second RF transceiver(s), communicatively connect to and use Google Maps. Google Maps' processors can determine the device's current location and direction from that location/source to any destination. The processors are programmed to estimate the location of the device from 3 sources: GPS (GPS uses satellites and knows your location within a few meters), Wi-Fi (the location of nearby Wi-Fi networks helps Maps know where you are), and cell towers (cell tower can be accurate up to a few thousand meters).</p>
<p>wherein the second processor selectively determines the location of the wireless mobile communications</p>	<p>Plaintiff contends each wireless mobile can set preference flags that enable or disable accessibility to data relevant to the device's location by Location-Based Services (LBS) providers. Such programmability by a wireless device is at times known as a privacy setting. Further, such programmability is available by location-permission granting (wireless mobile communications device must grant permission).</p> <p>The LBS providers' processors select to determine a wireless mobile communications device's location if the preference flags applicable to that device have been set for enablement. The processors select to not determine a wireless mobile communications</p>

Exemplary Claim	Corresponding Structure in Accused Systems
device dependent on the setting of preference flags,	device's location if the preference flags applicable to that device have not been set for enablement.
wherein the second processor determines the location of the wireless mobile communications device if the preference flags are set to a state that permits tracking of the user of the wireless mobile communications device and communicates the location of the wireless mobile communications device to the first processor via the second radio-frequency transmitter, and	<p>Plaintiff contends each wireless mobile can set preference flags that enable or disable accessibility to data relevant to the device's location by Location-Based Services (LBS) providers. The LBS providers' processors select to determine a wireless mobile communications device's location if the preference flags applicable to that device have been set for enablement. The processors select to not determine a wireless mobile communications device's location if the preference flags applicable to that device have not been set for enablement.</p> <p>The Navigation hardware/software will only be able to determine and track the location of the Wireless communication device such as but not limited to including but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc., Plaintiff contends each wireless mobile can set preference flags that enable or disable accessibility to data relevant to the device's location by Location-Based Services (LBS) providers. Such programmability by a wireless device is at times known as a privacy setting. Further, such programmability is available by location-permission granting (wireless mobile communications device must grant permission).</p> <p>Plaintiff contends that if the preference flags are enabled (i.e., the wireless-mobile-communication device's user has granted permission), LBS-providers' processor(s) proceed with determining the device's location and, when determined, communicates that location to the first processor through the second RF transceiver (which, as discussed above, is a transceiver to which the LBS-providers' processors communicatively couple). The LBS-providers' processors are programmed to estimate the location of the device from 3 sources: GPS (GPS uses satellites and knows your location within a few meters), Wi-Fi (the location of nearby Wi-Fi networks helps Maps know where you are), and cell towers (cell tower can be accurate up to a few thousand meters).</p>

Exemplary Claim	Corresponding Structure in Accused Systems
<p>wherein the second processor does not determine and communicate the location of the wireless mobile communications device if the preference flags are set to a state that prohibits tracking of the wireless mobile communications device.</p>	<p>Plaintiff contends that if the preference flags are not enabled (i.e., the wireless-mobile-communication device's user has not granted permission), LBS provider application hardware/software, will not be able to determine and track the location of the Wireless communication device (Exhibit B) such as but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc.</p>

19. Defendant makes, uses, offers to sell, and/or sells within or imports into the U.S., wireless-network components and related applications and programs, and related services that use identified locations of wireless devices to provide tracking such that Defendant infringes claims 1–30 of the '388 patent, literally or under the doctrine of equivalents.

20. Defendant put the inventions claimed by the '388 Patent into service (i.e., used them); but for Defendant's actions, the claimed-inventions embodiments involving Defendant's products and services would never have been put into service. Defendant's acts

complained of herein caused those claimed-invention embodiments as a whole to perform, and Defendant obtaining monetary and commercial benefit from it.

21. Defendant has and continues to induce infringement. Defendants have actively encouraged or instructed others (e.g., its customers, such as Verizon, T-Mobile and Sprint), and continues to do so, on how to use its products and services (e.g., wireless-network components and related applications and programs that use identified locations of wireless devices to provide tracking of mobile devices) such to cause infringement claims 1–30 of the '388 patent, literally or under the doctrine of equivalents. Moreover, Defendant has known and should have known of the '388 patent, by at least by the date of the patent's issuance, or from the issuance of the '284 patent, which followed the date that the patent's underlying application was cited to Defendants by the U.S. Patent and Trademark Office during prosecution of one of Defendant's patent applications, such that Defendant knew and should have known that it was and would be inducing infringement.

22. Defendant has and continues to contributorily infringe. Defendant has actively encouraged or instructed others (e.g., its customers and/or the customers of its related companies, such as Verizon, T-Mobile and Sprint), and continues to do so, on how to use its products and services e.g., wireless-network components and related applications and programs that use identified locations of wireless devices to provide tracking of mobile devices) such as to cause infringement of one or more of claims 1–30 of the '388 patent, literally or under the doctrine of equivalents. Moreover, Defendant has known of the '388 patent and the technology underlying it from at least the date of issuance of the patent or from the issuance of the '284 patent, which followed the date that the patent's underlying application was cited to Defendants by the U.S. Patent and Trademark Office during prosecution of one of

Defendant's patent applications, such that Defendant knew and should have known that it was and would be contributorily infringing.

23. Defendants have caused and will continue to cause Traxcell damage by infringing the '388 patent.

V. INFRINGEMENT ('147 Patent (Attached as exhibit C))

24. On October 27, 2020, U.S. Patent No. 10,820,147 ("the '147 patent") entitled "Mobile wireless device providing off-line and on-line geographic navigation information" (attached as Exhibit C) was duly and legally issued by the U.S. Patent and Trademark Office. Traxcell owns the '147 patent by assignment.

25. The '147 Patent's Abstract states, "A mobile device, wireless network and their method of operation provide both on-line (connected) navigation operation, as well as off-line navigation from a local database within the mobile device. Routing according to the navigation system can be controlled by traffic congestion measurements made by the wireless network that allow the navigation system to select the optimum route based on expected trip duration."

26. The following preliminary exemplary chart provides Traxcell's allegations of infringement.

Claim 1	Corresponding Structure in Accused Systems
1. A wireless communications system including:	<p>The Google Maps online navigation service and the Google Maps server-side or cloud infrastructure needed to provide the service, constitute the "Accused System".</p> <p>Each combination having at least one item listed on Exhibit A, at least one item listed on Exhibit B, and at least one item listed on Exhibit C is a wireless communications system.</p> <p>Because infringement liability is not dependent on ownership, e.g., use of a system can infringe (35 U.S.C. § 271), infringement is not dependent on ownership of all limitations of a claim.</p>
a first radio-frequency transceiver within a wireless mobile communications device and an associated first antenna to which the first radio-	<p>Plaintiff contends each item listed on Exhibit B corresponds to this claim limitation because each Exhibit-B item is a device that provides communicative access to a wireless network by transceivers designed and used for radio-frequency communication and at least one antenna. When a wireless communication device transceivers and antennas are in communication, they are coupled. Further, in addition to being so coupled, the transceiver of each Exhibit-B item is also configured for RF-communication wireless communication networks, such as AT&T, Verizon, T-Mobile, and other US networks (Cellular or WLAN) via Google Maps which comes preloaded on Exhibit-B items.</p> <p>Plaintiff contends each item listed on Exhibit B corresponds to this claim limitation because each</p>

Claim 1	Corresponding Structure in Accused Systems
<p>frequency transceiver is coupled, wherein the first radio-frequency transceiver is configured for radio-frequency communication with a wireless communications network;</p>	<p>Exhibit-B item includes a radio frequency transceiver. Wireless mobile communication device — including but not limited to Google’s branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list) — include radio-frequency transceivers and an associated antenna. When wireless communication device transceivers and antennas are in communication, they are coupled. Further, in addition to being so coupled, the transceiver of each Exhibit-B item is also configured for RF-communication with the wireless communication network.</p> <p>The following exemplifies this limitation’s existence in Accused Systems:</p> <p>Step 37 Disconnect the antennas</p> <div data-bbox="370 724 972 1295"> </div> <div data-bbox="1045 720 1474 846"> </div> <div data-bbox="1052 877 1482 1029"> <ul style="list-style-type: none"> ● Use the pointed end of a spudger and pry up gently to unclip the top antenna connector from the motherboard. ● Disconnect the bottom antenna connector. </div> <div data-bbox="915 1125 1500 1255"> <p>Wireless mobile communication device (Exhibit B), such as Google pixel 4a includes antenna connector.</p> </div> <p>Attachment 1 (Google Pixel 4XL showing antenna connector) at 21.</p>

Claim 1

Corresponding Structure in Accused Systems



Google Pixel 4a 5G Disassembly Teardown Repair Video Review

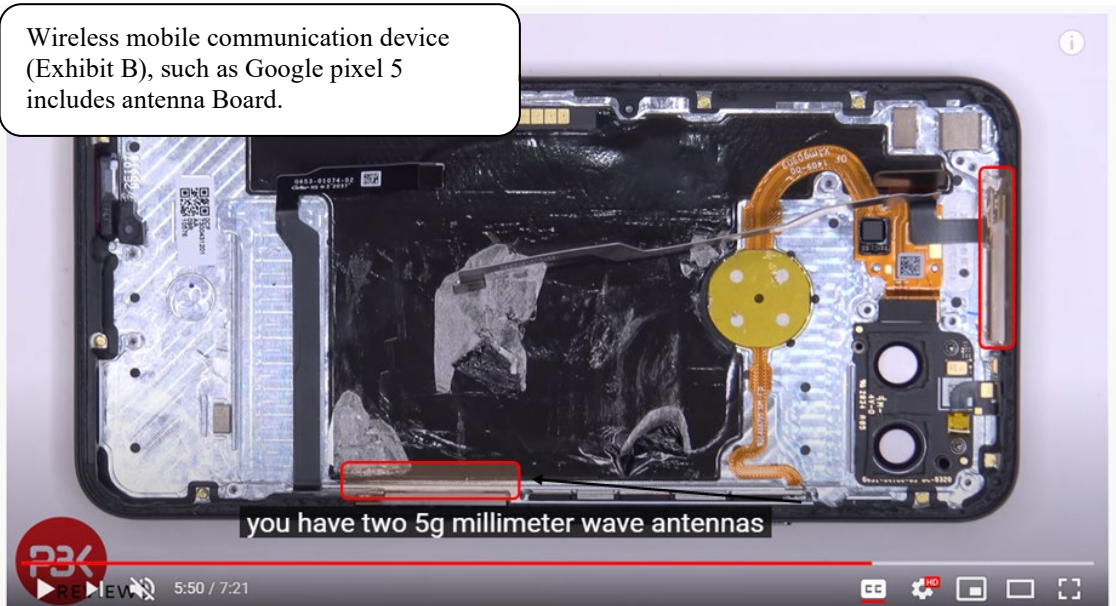
3,430 views • Dec 5, 2020

160 0 SHARE

Source: Antenna of Google pixel 4a Teardown by PBKreviews (Time 3:58/8:36)

Link: <https://www.youtube.com/watch?v=pTPup76PxNo>

Wireless mobile communication device (Exhibit B), such as Google pixel 5 includes antenna Board.



Google Pixel 5 5G Disassembly Teardown Repair Video Review. Screen Gap?

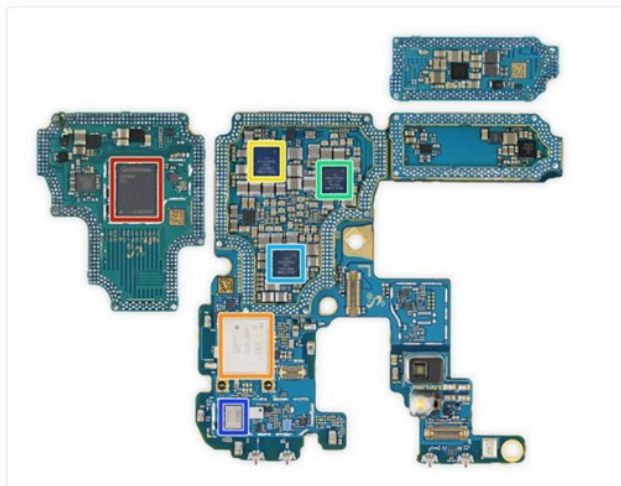
Source: Antenna of Google pixel 5 Teardown by PBKreviews (Time-5:50/7:21)

Claim 1

Corresponding Structure in Accused Systems

Link: <https://www.youtube.com/watch?v=PPvISHyok68>

Step 9



- But wait! Flippin' the boards over reveals even more flippin' chips:

- Qualcomm SDR865 RF Transceiver
- Murata KM9D19075 Wi-Fi & Bluetooth Module

- Qualcomm PM8250 power management IC
- Qualcomm PMX55 power management IC
- Qualcomm PM8150C power management IC
- Qualcomm QDM4870 front-end module

Wireless mobile communication device (Exhibit B) such as Samsung Galaxy S20 includes RF transceiver.

Attachment 2 (Teardown of Samsung Galaxy S20 showing RF Transceiver component) at 8.

Step 5



TOOL USED ON THIS STEP:
Manta Driver Kit - 112 Bit Driver Kit

\$64.99



- We continue to raid the toolbag for bigger and beefier tools—like this [Manta kit](#) driver, which works equally well for swatting away screws and smashing walnuts. Just don't mix them up.

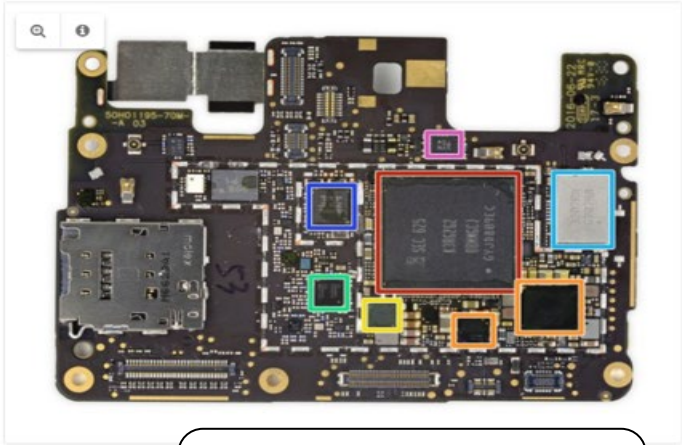
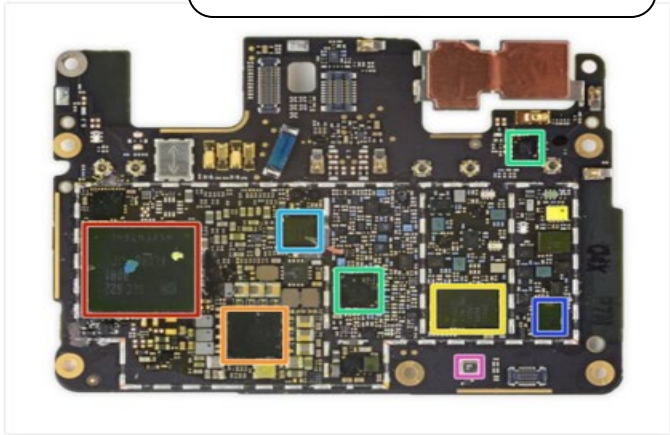
ⓘ These screws are all named Phillip. We like Phillip; it's a solid name for a screw.

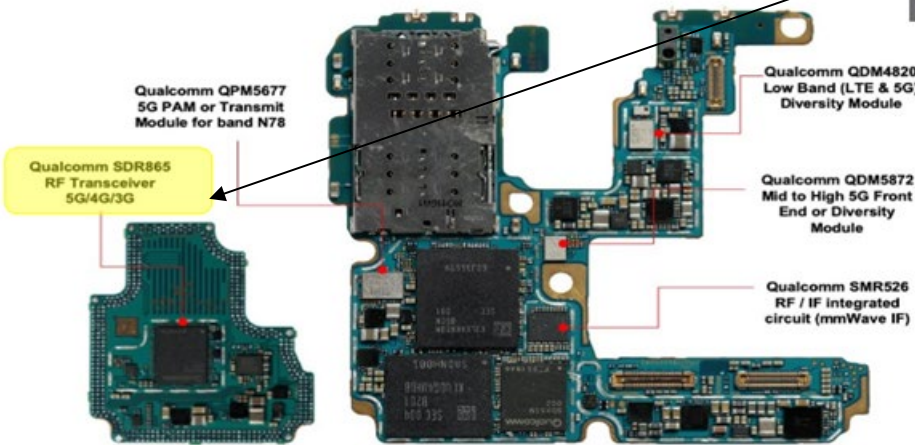
- With the top [layer of antennas](#), speaker, and charge coils flipped aside, we get a clear look at the internals. It does look a lot like a [Note10+ 5G](#) in there, if you eliminated the stylus and used that space for more battery.

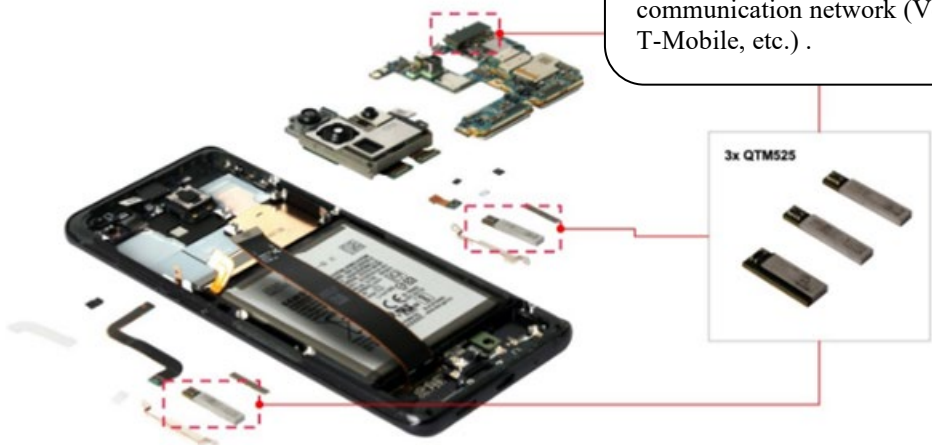
📌 Stay tuned for our [teardown wallpaper](#) post! We'll have your Ultra wallpapers, as well as your Plus and your standard S20.



- We waste no time extracting the main board, which comes so laden with cameras, millimeter-wave hardware, and extra board layers that it feels like only half a victory. Time to start chucking things over-board.

Wireless mobile communication device (Exhibit B), such as Samsung Galaxy S20 includes antenna cables.

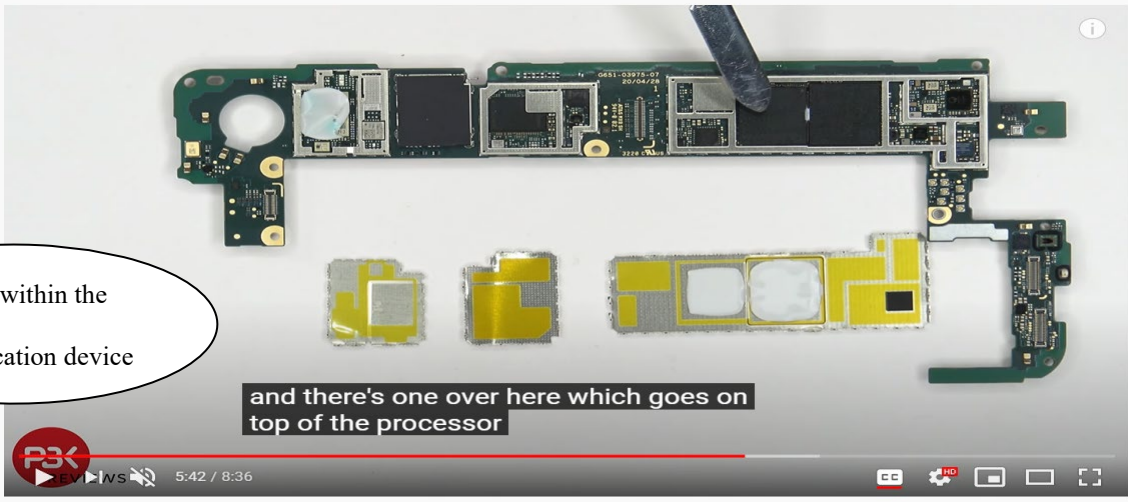
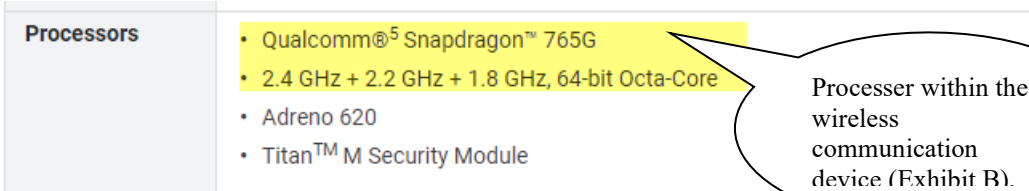
Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="358 237 1344 270">Attachment 2 (ifixit Teardown of Samsung Galaxy S20 showing antenna) at 05.</p> <p data-bbox="380 436 477 464">Step 10</p> <div data-bbox="380 485 1057 926">  </div> <p data-bbox="581 930 948 1020">Wireless mobile communication device (Exhibit B) such as Google Pixel includes RF transceiver.</p> <p data-bbox="370 993 467 1020">Step 11</p> <div data-bbox="370 1041 1036 1472">  </div> <div data-bbox="1084 510 1500 1486"> <ul style="list-style-type: none"> Chips on the front of the motherboard: <ul style="list-style-type: none"> Samsung K3RG2G20BM-MGCJ 4 GB LPDDR4 mobile DRAM with a quad-core Qualcomm Snapdragon 821 processor layered underneath (two cores clocked at 2.15 GHz and two cores clocked at 1.6 Ghz) Qualcomm PMI8996 power management IC, and Qualcomm SMB1350 Quick Charge 3.0 IC NXP TFA9891 smart audio amplifier Qualcomm WTR4905 LTE RF transceiver 3207RA G707A (looks like Wi-Fi) NXP 55102 1807 S0622 (likely NFC controller) Bosch Sensortec BMI160 low power IMU And on the back: <ul style="list-style-type: none"> Samsung KLUBG4G1CE-B0B1 32 GB Universal Flash Storage (UFS) 2.0 Qualcomm PM8996 Power Management IC Avago ACPM-7800 power amplifier Qualcomm WTR3925 LTE RF transceiver, and Qualcomm RF360 Dynamic Antenna Matching Tuner (QFE2550) Qualcomm WCD9335 audio codec Skyworks SKY77807 Quad-Band Power Amplifier Module (PAM) Bosch Sensortec BMP280-series barometric pressure sensor <p data-bbox="358 1514 1299 1547">Attachment 13 (Google Pixel showing RF Transceiver component) at 9&10.</p> </div>

Claim 1	Corresponding Structure in Accused Systems
	<p>While the 1st Gen 5G smartphone supported only single or dual band 5G, the 2nd Gen designs like the Samsung Galaxy S20 now support much more. The Galaxy S20 Ultra under review here is model number SM-G988U1 for the North American market which supports low band FDD 5G like n5 (850MHz) and n71 (600MHz) as well as mid-to-high bands like n2, n41 and n66. For 5G global roaming, the Galaxy S20 Ultra also included the common Ultra-High Frequency (UHF) 5G band n78. Further, the Galaxy S20 Ultra has millimeter wave (mmWave) antenna modules in addition to the Sub-6GHz RFFE. The new Qualcomm QTM0525 antenna modules in the Galaxy S20 Ultra support an additional four ultra-wide 5G bands (n258, n257, n260 and n261). So how do all these RF capabilities come together inside the Galaxy S20? Let's dive in for a closer</p> <p>5g-modem-to-rf-integration-rf</p>  <p>Wireless mobile communication device (Exhibit B) such as Samsung Galaxy S20 Ultra includes RF transceiver.</p> <p>Attachment 3 (RF-Transceiver and antenna of Galaxy S20 device coupled with communication network) at 7.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p>The first 5G devices in the US were based on mmWave technology. The 1st generation 5G devices were either using Qualcomm's mmWave antenna module design for mmWave networks (Verizon, AT&T, T-Mobile) or a more conventional RFFE design for sub-6 GHz 5G networks (Sprint). However, that represented a design compromise since each variant would be shut out from other 5G network. With the 2nd Gen 5G designs like the Galaxy S20 Ultra, OEMs are adding mmWave capabilities along with Sub-6 GHz 5G RFFE on the same device. This dual RFFE design allows flagship devices to be network agnostic, opening up many more 5G network and also benefits Samsung by reducing 5G SKUs.</p> <p>5g-modem-to-rf-integration-mmwave</p>  <p>Wireless mobile communication device (Exhibit B) such as Samsung Galaxy S20 Ultra includes RF transceiver antenna (mmwave) designed to connect wireless communication network (Verizon, AT&T, T-Mobile, etc.) .</p> <p>Attachment 3 (RF-Transceiver and antenna of Galaxy S20 device coupled with communication network) at 10.</p>

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="380 237 893 273"> <h3>Change mobile network settings</h3> </div> <div data-bbox="380 289 805 386"> <ol style="list-style-type: none"> 1. Open your phone's Settings app. 2. Tap Network & internet > Mobile network. 3. Tap a setting. </div> <div data-bbox="380 405 1385 462"> <p>Tip: To reset all your network settings, in your phone's Settings app, tap System > Advanced > Reset options > Reset Wi-Fi, mobile & Bluetooth.</p> </div> <hr/> <div data-bbox="402 510 753 535"> <p>Available mobile network settings</p> </div> <div data-bbox="425 573 946 598"> <p>The following options vary by phone and Android version:</p> </div> <div data-bbox="425 617 1347 940"> <ul style="list-style-type: none"> • Mobile data: Turn mobile data on or off. • Roaming: Let your phone send data over other carriers' networks when you're away from your carrier's networks. • App data usage: Learn how to check app usage of your mobile data. • Data warning & limit: Learn how to reduce mobile data use. • Preferred network type: Pick your preferred network type from options, like 5G and LTE. Learn more about 5G on Pixel phones. • Network: Pick your network operator from available networks. • Access point names: Help your carrier find the right IP address for your phone and connect your phone securely. </div> <div data-bbox="1107 636 1484 753" style="border: 1px solid black; padding: 5px;"> <p>Wireless mobile communication device (Exhibit B) able to connect to a wireless communication network</p> </div> <div data-bbox="354 1003 1477 1068"> <p>Attachment 14 (Method to connect a wireless communication network via Google pixel 4a device) at 1.</p> </div> <div data-bbox="363 1247 466 1283"> <p>Apps</p> </div> <div data-bbox="371 1335 451 1388">  </div> <div data-bbox="459 1344 714 1383"> <p>Google Pay</p> </div> <div data-bbox="371 1400 1468 1463"> <p>Pay with your Android phone at participating stores and within mobile apps with Google Pay™.</p> </div> <div data-bbox="371 1480 876 1512"> <p>Visit support.google.com/pay to learn more.</p> </div> <div data-bbox="368 1526 609 1612">  </div> <div data-bbox="896 1470 1464 1560"> <p>Google Maps preloaded in the Wireless mobile communication devices (Exhibit B), Such as Galaxy S20, Pixel 4a, Pixel 4a 5G, Pixel 5</p> </div> <div data-bbox="371 1612 1445 1675"> <p>Get directions and other location-based information. You must enable location services to use Google Maps. For more information, see Location.</p> </div> <div data-bbox="371 1692 1005 1722"> <p>Visit support.google.com/maps to learn more.</p> </div> <div data-bbox="354 1757 1416 1791"> <p>Attachment 15 (Google Maps application preloaded on Samsung Galaxy S20) at 113.</p> </div>

Claim 1	Corresponding Structure in Accused Systems
<div data-bbox="207 976 641 1129" style="border: 1px solid black; border-radius: 10px; padding: 10px; width: fit-content;"> Wireless mobile communication device (Exhibit B) able to connect to a wireless communication network </div>	<div data-bbox="358 233 1466 579">  <p>Google Pixel 4a, Google Pixel 4a 5G, and Google Pixel 5 product pages. Each page shows the phone's design, a 'REVIEW' section with 'SPECIFICATIONS', 'READ OPINIONS', and 'PICTURES' links, and a price section with '128GB 6GB RAM' or '128GB 8GB RAM' and 'ALL PRICES'.</p> </div> <p>Attachment 4 (Google Maps application preloaded on Pixel 4a, Pixel 4a 5G, and Pixel 5) at 1.</p> <div data-bbox="358 695 1526 1730"> <div data-bbox="415 695 581 743" style="border: 1px solid red; padding: 2px;">Network⁸</div> <ul style="list-style-type: none"> • LTE: Up to 4CC (12 layers) DL & 2CC UL⁹ 5G Sub-6¹⁰ <ul style="list-style-type: none"> • TDD: Up to 1CC x 100 MHz 4x4 MIMO DL & 1CC x 100 MHz UL • FDD: Up to 1CC x 20 MHz 4x4 MIMO DL & 1CC x 20 MHz UL⁹ 5G mmWave [US only]^{10, 11} <ul style="list-style-type: none"> • TDD: Up to 4CC x 100 MHz 2x2 MIMO DL & 1CC x 100 MHz 2x2 M <div data-bbox="683 1014 1102 1056" style="border: 1px solid red; padding: 2px;">[US / FI / CA / TW] Model G025E</div> <ul style="list-style-type: none"> • GSM/EDGE: Quad-band (850, 900, 1800, 1900 MHz) • UMTS/HSPA+/HSDPA: Bands 1/2/4/5/8 • CDMA EVDO Rev A: BC0/BC1/BC10 • LTE: Bands B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29, 30/32/38/39/40/41/42/46/48/66/71 • 5G Sub-6: Bands n1/2/5/12/25/28/41/66/71/78 • eSIM <div data-bbox="683 1350 976 1392" style="border: 1px solid red; padding: 2px;">[Verizon] Model G6QU3</div> <ul style="list-style-type: none"> • GSM/EDGE: Quad-band (850, 900, 1800, 1900 MHz) • UMTS/HSPA+/HSDPA: Bands 1/2/4/5/8 • CDMA EVDO Rev A: BC0/BC1/BC10 • LTE: Bands B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29, 30/32/38/39/40/41/42/46/48/66/71 • 5G Sub-6: Bands n2/5/12/25/66/71 • 5G mmWave: Bands n260/261 • eSIM </div> <p>Attachment 7 (Pixel phone hardware tech specs) at 6.</p>

Claim 1	Corresponding Structure in Accused Systems
<p>a first processor within the wireless mobile communications device coupled to the at least one first radio-frequency transceiver</p>	<p>Plaintiff contends each item listed on Exhibit B corresponds to this claim limitation because each Exhibit-B item includes a processor. Wireless mobile communication device- including but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list) has a processor, for example, Quad-Core/ Octa-core processor.</p> <p>Each Exhibit-B-listed mobile wireless communications device's motherboard processor is programmed to process location-service information; i.e., to receive a location of the device from the wireless communications network (which is communicated to the device from the first RF transceiver) and generate an indication of the device's location with respect to geographic features according to mapping information stored within the device. For example, the motherboard processor may use Google Maps to view and find places around the globe. The processor and base station transceivers communicate by RF communication and, thus, when doing so are communicatively coupled.</p> <p>The following exemplifies the existence of this limitation in Accused Systems:</p>  <p>Processor within the wireless communication device</p> <p>Google Pixel 4a 5G Disassembly Teardown Repair Video Review</p> <p>Source: Processor of Google pixel 4a Teardown by PBKreviews (Time-5:42/8:36)</p> <p>Link: https://www.youtube.com/watch?v=pTPup76PxNo&ab_channel=PBKreviews</p>  <p>Processors</p> <ul style="list-style-type: none"> Qualcomm® 5 Snapdragon™ 765G 2.4 GHz + 2.2 GHz + 1.8 GHz, 64-bit Octa-Core Adreno 620 Titan™ M Security Module <p>Processor within the wireless communication device (Exhibit B).</p> <p>Attachment 7 (Specifications of Google pixel 5) at 1.</p>

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="380 239 542 310" style="border: 1px solid red; padding: 2px; width: fit-content;">Wireless and Location</div> <ul style="list-style-type: none"> • Wi-Fi 2.4 GHz + 5 GHz 802.11a/b/g/n/ac 2x2 MIMO • Bluetooth®¹⁰ 5.0 + LE, A2DP (HD codecs: AptX, AptX HD, LDAC, AAC) • NFC • Google Cast • Dual band (L1 + L5) and (E1 + E5a) <div data-bbox="591 401 959 472" style="background-color: yellow; padding: 2px;">[US]</div> <ul style="list-style-type: none"> • GPS, GLONASS, Galileo, QZSS <div data-bbox="591 478 667 506" style="background-color: yellow; padding: 2px;">[ROW]</div> <ul style="list-style-type: none"> • GPS, GLONASS, Galileo, QZSS, BeiDou <div data-bbox="380 562 526 604" style="border: 1px solid red; padding: 2px; width: fit-content;">Network¹¹</div> <ul style="list-style-type: none"> • LTE: Up to 4CC (12 layers) DL & 2CC UL¹² <div data-bbox="591 611 716 638" style="background-color: yellow; padding: 2px;">5G Sub-6¹³</div> <ul style="list-style-type: none"> • TDD: Up to 1CC x 100 MHz 4x4 MIMO DL & 1CC x 100 MHz UL • FDD: Up to 1CC x 20 MHz 4x4 MIMO DL & 1CC x 20 MHz UL¹² <div data-bbox="591 716 1386 787" style="background-color: yellow; padding: 2px;">5G mmWave [US only]¹³</div> <ul style="list-style-type: none"> • TDD: Up to 4CC x 100 MHz 2x2 MIMO DL & 1CC x 100 MHz 2x2 MIMO UL¹² <div data-bbox="591 793 1330 1031" style="background-color: yellow; padding: 2px;">[US / FI] Model GD1YQ</div> <ul style="list-style-type: none"> • GSM/EDGE: Quad-band (850, 900, 1800, 1900 MHz) • UMTS/HSPA+/HSDPA: Bands 1,2,4,5,6,8,19 • CDMA EVDO Rev A: BC0/BC1/BC10 • LTE: Bands B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29/30/32/38/39/40/41/42/46/48/66/71 • 5G Sub-6: Bands n1/2/3/5/7/8/12/28/41/66/71/77/78 • 5G mmWave: Bands n260/n261 • eSIM <div data-bbox="1029 302 1500 667" style="border: 1px solid black; border-radius: 15px; padding: 10px; margin-top: 20px;"> <p>Processor within the wireless communication device (Exhibit B), such as google pixel 5 configured to communicate with wireless communication network with help of inbuilt RF transceiver. Further, the processor receive a location of the wireless mobile communications device (Exhibit B) from the wireless communications network</p> </div>

Attachment 7 (Specifications of Google pixel 5) at 2.

Claim 1

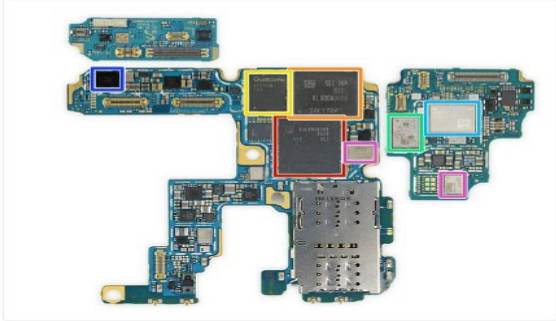
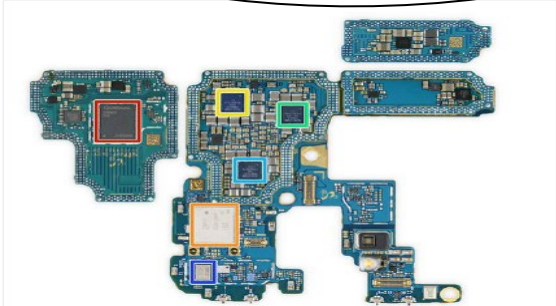
Corresponding Structure in Accused Systems

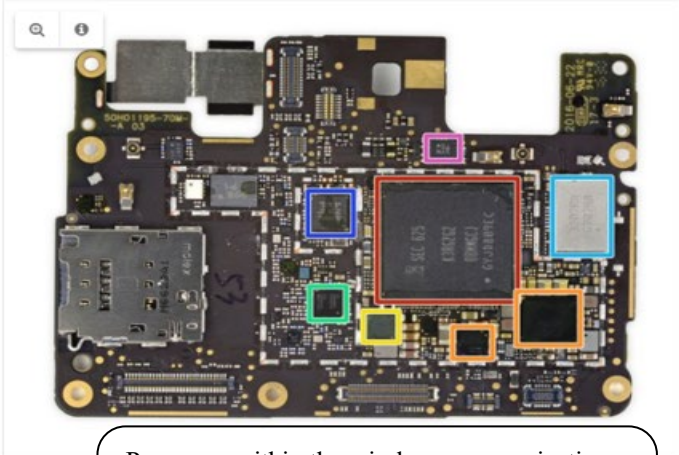
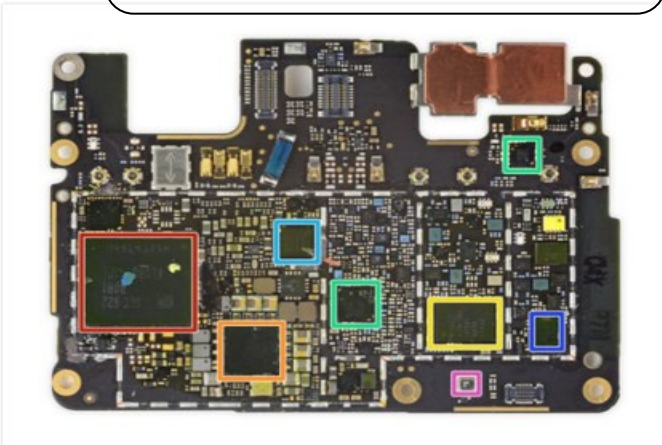
Processor within the wireless communication device (Exhibit B), such as Google Pixel 4a, Pixel 4a 5G and Pixel 5

The image shows three Google Pixel phones side-by-side: Pixel 4a, Pixel 4a 5G, and Pixel 5. Each phone is displayed with its front screen showing a large number (4, 4a, or 5) and a 'REVIEW' button. Below each phone is a 'FULL OR DIFFERENCES' button and a '128GB 6GB RAM' label. To the right of each phone is an 'ALL PRICES' button. A 'Change compare mode' link is at the bottom left.

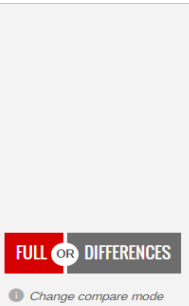
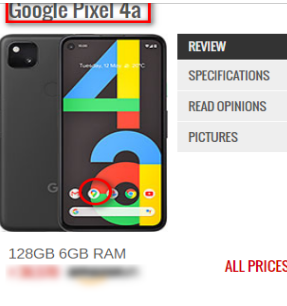
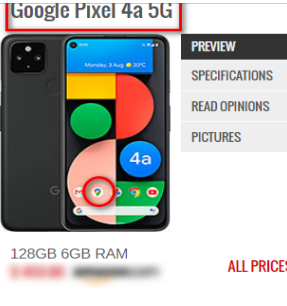
NETWORK	Technology	GSM / HSPA / LTE	GSM / HSPA / LTE / 5G	GSM / CDMA / HSPA / EVDO / LTE / 5G
LAUNCH	Announced Status	2020, August 03 Available. Released 2020, August 20	2020, September 30 Available. Released 2020, November 05	2020, September 30 Available. Released 2020, October 15
BODY	Dimensions	144 x 69.4 x 8.2 mm (5.67 x 2.73 x 0.32 in)	153.9 x 74 x 8.2 mm (Sub-6) or 8.5 mm (Sub-6 and mmWave)	144.7 x 70.4 x 8 mm (5.70 x 2.77 x 0.31 in)
	Weight	143 g (5.04 oz)	168 g (5G Sub-6); 171 g (5G Sub-6 and mmWave) (5.93 oz)	151 g (5.33 oz)
	Build	Glass front (Gorilla Glass 3), plastic back, plastic frame	Glass front (Gorilla Glass 3), plastic back, plastic frame	Glass front (Gorilla Glass 6), aluminum back, aluminum frame
	SIM	Nano-SIM and/or eSIM	Nano-SIM and/or eSIM	Nano-SIM and/or eSIM
DISPLAY	Type	OLED, HDR	OLED, HDR	OLED, 90Hz, HDR10+
	Size	5.81 inches, 83.2 cm ² (~83.3% screen-to-body ratio)	6.2 inches, 95.7 cm ² (~84.1% screen-to-body ratio)	6.0 inches, 87.6 cm ² (~85.9% screen-to-body ratio)
	Resolution	1080 x 2340 pixels, 19.5:9 ratio (~443 ppi density)	1080 x 2340 pixels, 19.5:9 ratio (~413 ppi density)	1080 x 2340 pixels, 19.5:9 ratio (~432 ppi density)
	Protection	Corning Gorilla Glass 3 Always-on display	Corning Gorilla Glass 3 Always-on display	Corning Gorilla Glass 6 Always-on display
PLATFORM	OS	Android 10, upgradable to Android 11	Android 11	Android 11
	Chipset	Qualcomm SDM730 Snapdragon 730G (8 nm)	Qualcomm SM7250 Snapdragon 765G (7 nm)	Qualcomm SM7250 Snapdragon 765G (7 nm)
	CPU	Octa-core (2x2.2 GHz Kryo 470 Gold & 6x1.8 GHz Kryo 470 Silver)	Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)	Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)
	GPU	Adreno 618	Adreno 620	Adreno 620

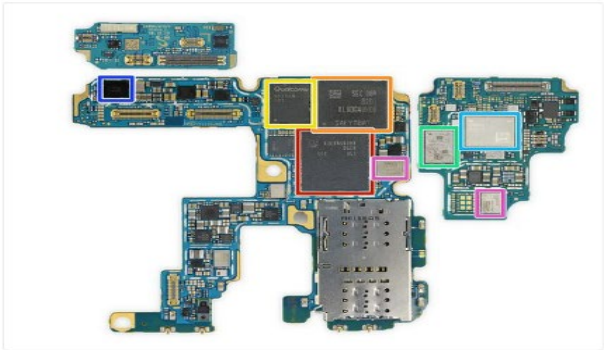
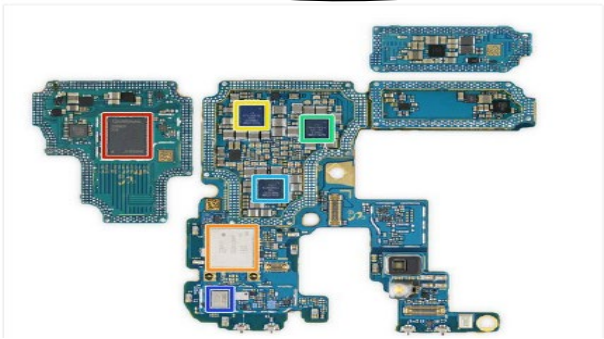
Attachment 4 (Processor of Google Pixel 4a, Pixel 4a 5G and Pixel 5) at 1.

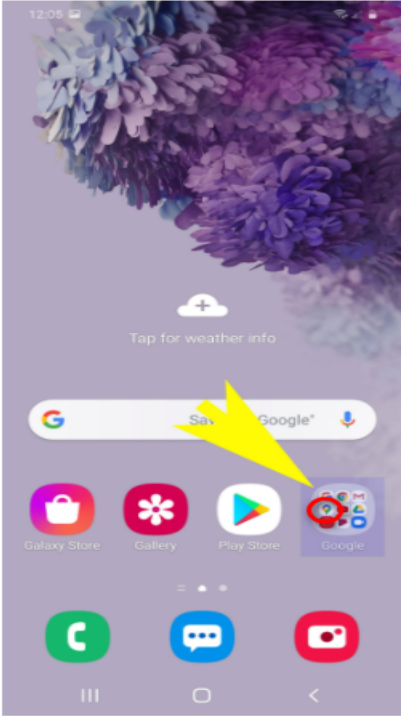
Claim 1	Corresponding Structure in Accused Systems
	<p>Step 8</p>  <ul style="list-style-type: none"> • With all shields down, we can get a better look at the silicon hiding beneath: <ul style="list-style-type: none"> • Samsung K3LK4K40BM-BGCN 12 GB LPDDR5 RAM layered over Qualcomm 865 SoC • Samsung KLUDG4UHD8-B2D1 128 GB UFS 3.0 flash storage • Qualcomm SDX55M 2nd-gen 5G modem • Skyworks SKY58210-11 RF Front-End Module • Qorvo QM78092 Front-End Module • Maxim MAX77705C power management IC • Qualcomm QPM5677 and QPM6585 5G power amplification modules <p>Processor within the wireless communication device (Exhibit B), such as Samsung Galxy S20 coupled with RF transceiver and Wi-Fi Module</p> <p>Step 9</p>  <ul style="list-style-type: none"> • But wait! Flippin' the boards over reveals even more flippin' chips: <ul style="list-style-type: none"> • Qualcomm SDR865 RF Tranceiver • Murata KM9D19075 Wi-Fi & Bluetooth Module • Qualcomm PM8250 power management IC • Qualcomm PMX55 power management IC • Qualcomm PM8150C power management IC • Qualcomm QDM4870 front-end module <p>Attachment 2 (Teardown of Samsung Galaxy S20 showing RF Transceiver component) at 8.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p>Step 10</p>  <p>Processor within the wireless communication device (Exhibit B), such as Google pixel coupled with RF transceiver and Wi-Fi Module</p> <p>Step 11</p>  <p>Attachment 13 (Google Pixel showing RF Transceiver component) at 9&10.</p> <ul style="list-style-type: none"> Chips on the front of the motherboard: <ul style="list-style-type: none"> Samsung K3RG2G20BM-MGCJ 4 GB LPDDR4 mobile DRAM with a quad-core Qualcomm Snapdragon 821 processor layered underneath (two cores clocked at 2.15 GHz and two cores clocked at 1.6 Ghz) Qualcomm PM18996 power management IC, and Qualcomm SMB1350 Quick Charge 3.0 IC NXP TFA9891 smart audio amplifier Qualcomm WTR4905 LTE RF transceiver 3207RA G707A (looks like Wi-Fi) NXP 55102 1807 S0622 (likely NFC controller) Bosch Sensortec BMI160 low power IMU And on the back: <ul style="list-style-type: none"> Samsung KLUBG4G1CE-B0B1 32 GB Universal Flash Storage (UFS) 2.0 Qualcomm PM8996 Power Management IC Avago ACPM-7800 power amplifier Qualcomm WTR3925 LTE RF transceiver, and Qualcomm RF360 Dynamic Antenna Matching Tuner (QFE2550) Qualcomm WCD9335 audio codec Skyworks SKY77807 Quad-Band Power Amplifier Module (PAM) Bosch Sensortec BMP280-series barometric pressure sensor
programmed to receive information indicative of a location of the wireless mobile communications device and generate an indication of a location of the wireless mobile communications device with respect to geographic	<p>Plaintiff contends the Exhibit-B-listed mobile-wireless-communications device's motherboard processor is programmed to process location-service information; i.e., to receive a location of the device from the wireless communications network and generate an indication of the device's location.</p> <p>For example, the motherboard processor may use Google Maps to obtain the device's location and provide direction from that location to a destination. Wireless mobile communication device—including but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list) has a processor for example, Quad-Core processor. When wireless communication device transceivers and processor are in communication, they are coupled. Further, the Location-based Service (LBS) provider, such as Google Map, on the Exhibit-B utilizes the processor coupled to the transceiver to estimates/receive the location on mobile wireless communications devices (specifically one or more of the mobile wireless communications devices identified on</p>

Claim 1	Corresponding Structure in Accused Systems
features	<p>Exhibit B) by utilizing wireless communication network or first computer.</p> <p>For example, the motherboard processor may use Google Maps to view and find places around the globe. Google map can also show your current location and provide direction (including with respect to geographic features such as nearby restaurants) from your location/source to any destination. In using Google Maps App, the mobile wireless communication device's motherboard processor generates signals for displaying on the device's screen a blue dot that shows the current location of the wireless mobile communication device. The Google map app estimates the location of the device from 3 sources: GPS (GPS uses satellites and knows your location within a few meters), Wi-Fi (the location of nearby Wi-Fi networks helps Maps know where you are), and cell towers (cell tower can be accurate up to a few thousand meters). When Google Maps isn't sure about your location, a light blue circle around the blue dot is shown. You might be anywhere within the light blue circle. The smaller the circle, the more certain the app is about your location.</p> <p>Furthermore, Google Maps App provides flexibility to download maps on SD card/internal memory of communication device (Exhibit B) examples of compatible devices is Samsung Galaxy S20, Pixel 4a, Pixel 4a 5G, Pixel 5, etc., and navigate offline. When internet is slow or mobile data is expensive, or communication device cannot connect to internet, an area can be saved to phone or tablet (Exhibit B) from Google maps app and use it when offline. Communication device can use Offline maps for Navigation through the downloaded area without internet.</p> <p>The following exemplifies the existence of this limitation in Accused Systems:</p>

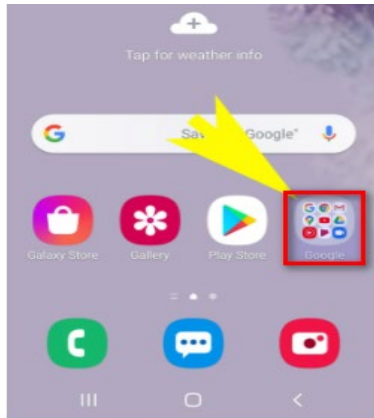
Claim 1	Corresponding Structure in Accused Systems																																																																
	  																																																																
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Attachment 4 (Processor of Google Pixel 4a, Pixel 4a 5G and Pixel 5) at 1.																																																																	

Claim 1	Corresponding Structure in Accused Systems
	<p>Step 8</p>  <p>Processor within the wireless communication device (Exhibit B), such as Samsung Galxy S20 coupled with RF transceiver and Wi-Fi Module</p> <p>Step 9</p>  <p>Attachment 2 (RF Transceiver and Processor of Samsung Galaxy S20) at 8.</p> <ul style="list-style-type: none"> With all shields down, we can get a better look at the silicon hiding beneath: <ul style="list-style-type: none"> Samsung K3LK4K40BM-BGCN 12 GB LPDDR5 RAM layered over Qualcomm 865 SoC Samsung KLUDG4UHDB-B2D1 128 GB UFS 3.0 flash storage Qualcomm SDX55M 2nd-gen 5G modem Skyworks SKY58210-11 RF Front-End Module Qorvo QM78092 Front-End Module Maxim MAX7705C power management IC Qualcomm QPM5677 and QPM6585 5G power amplification modules But wait! Flippin' the boards over reveals even more flippin' chips: <ul style="list-style-type: none"> Qualcomm SDR865 RF Tranceiver Murata KM9D19075 Wi-Fi & Bluetooth Module Qualcomm PM8250 power management IC Qualcomm PMX55 power management IC Qualcomm PM8150C power management IC Qualcomm QDM4870 front-end module <p>Add a comment</p>

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="370 254 1518 289">Using Turn-by-Turn Navigation with the Galaxy S20 Google Maps</p> <p data-bbox="370 312 643 336">Time Needed : 8 minutes</p> <p data-bbox="370 367 1518 420">The following steps demonstrate the actual process of setting up and utilizing turn-by-turn navigation system with the Google Maps app on the new Samsung Galaxy S20 handset.</p> <p data-bbox="370 422 1518 474">Before you begin, verify and ensure that location is enabled on your phone. It has to be enabled so that your device can determine your current location.</p> <p data-bbox="414 504 1036 527">1. Tap to open the Google folder from the Home screen.</p> <p data-bbox="436 529 1256 552">A new screen consisting of Google-related apps and services will be displayed.</p>  <p data-bbox="357 1325 1068 1356">Attachment 5 (how to use turn by turn Google map) at 1.</p>

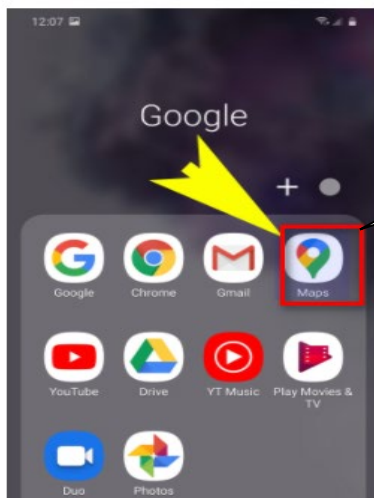
Claim 1

Corresponding Structure in Accused Systems



2. Tap Maps to open Google Maps app.

If this is the first time you use Google Maps on your Galaxy S20, you'll be prompted with a Welcome screen. If you see this screen, read and review the information then tap **GOT IT** to proceed.



Google Maps preloaded in the Wireless mobile communication devices (Exhibit B), such as Galaxy S20.

Attachment 5 (how to use turn by turn google map) at 2&3.



Personal Business

Shop Why Verizon Support

Home > Support > Sony > Sony Xperia Z2 > Google Maps - Find Current Location

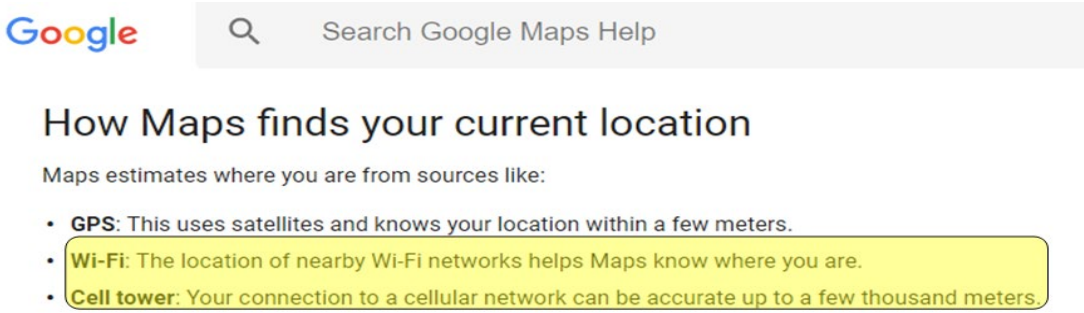
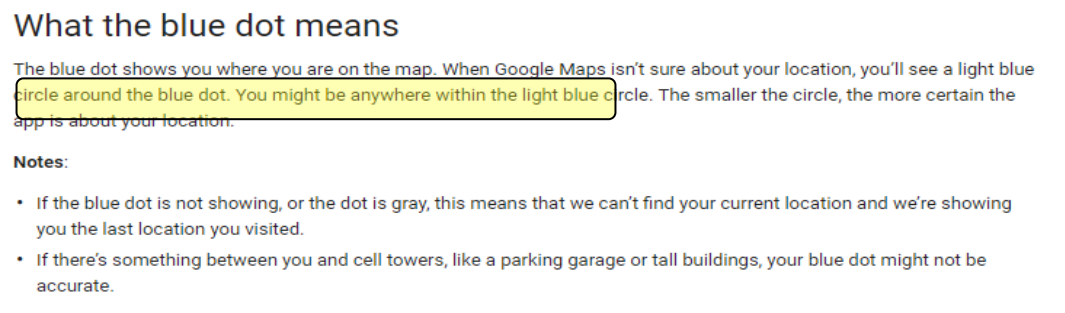
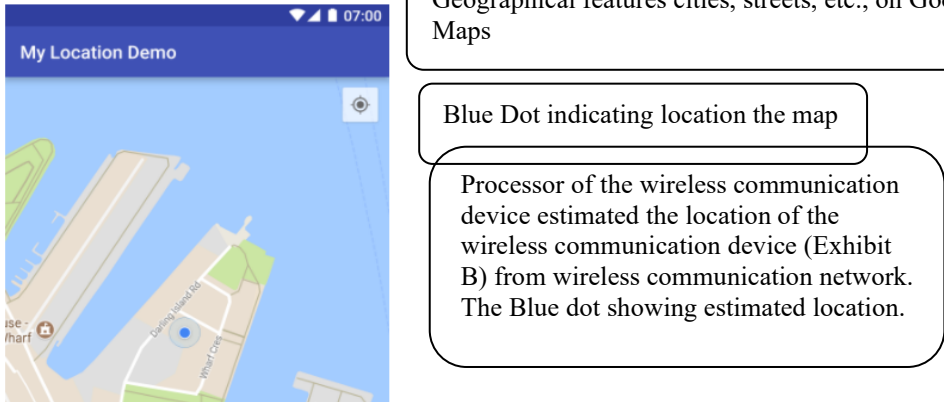
Google Maps™ - Find Current Location

Notes:



- If the Google Maps app isn't already installed on your device, it can be [downloaded](#) from the Google Play Store™.
- For further assistance, refer to the Google Maps [Help Center](#).


- From a Home screen, tap **Apps**.
- Tap **Maps**.
- Tap the **My Location icon** (located in the lower-right).

Wireless communication network (e.g. Verizon, AT&T, T-Mobile, etc.) used to estimate the location of the Wireless communication device (Exhibit B) on Google Maps.

Claim 1	Corresponding Structure in Accused Systems
	<p>Attachment 6 (Find Current Location on Google map) at 1.</p>  <p>Attachment 8 (How map finds your current location) at 2.</p>  <p>Attachment 8 (Current location shown on google map) at 3.</p>  <p>Source: Location estimation on the Wireless communication device</p> <p>Attachment 22 (Location estimation on the Wireless communication device) at 10.</p>

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="355 247 930 1266"> </div> <div data-bbox="1027 262 1485 1192"> <p>By default the “Location setting” is set at “High accuracy” mode, wherein, for example, accuracy of location of a communications device determined based on locations of nearby Wi-Fi network infrastructure (access points or hotspots) is further enhanced or fine-tuned by Google Maps Server additionally using the said communications device’s GPS location and the location data obtained from the mobile network (Cell tower information and/or Location of the communications device determined through the Assisted-GPS method by the said mobile network) serving the said communications device.</p> </div> <p data-bbox="355 1302 1198 1333">Attachment 45 (Google Maps_Android app_Location settings) at 1.</p>

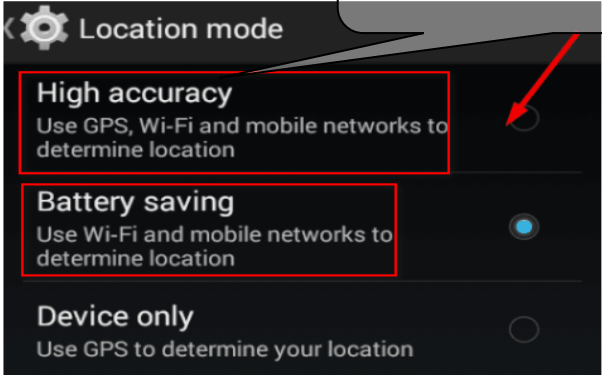
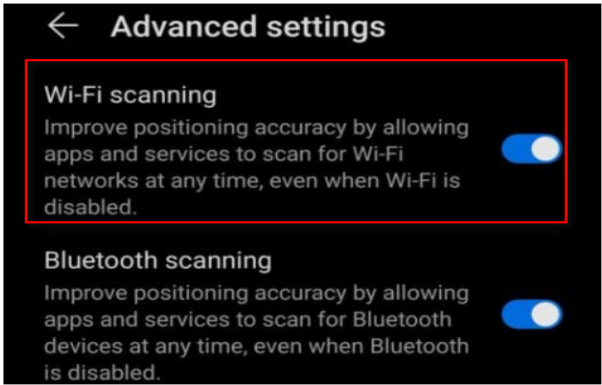
Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="375 258 1321 315">Find and improve your location's accuracy</p> <p data-bbox="375 333 1455 428">Sometimes Google Maps might have trouble finding where you are located. If the GPS location of your blue dot on the map is inaccurate or the blue dot is not showing up, here are some things you can do to help fix the problem.</p> <p data-bbox="375 455 1187 483">Tip: This will also improve your search results and make them more relevant to you.</p> <p data-bbox="394 562 807 590">Computer Android iPhone & iPad</p> <hr data-bbox="375 619 1482 623"/> <p data-bbox="375 682 1008 724">See your current location on the map</p> <ol data-bbox="375 743 1445 867" style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. You'll see a blue dot, which shows where you are. If you don't see a blue dot, go to the bottom and tap Your location . <p data-bbox="375 928 1008 970">How Maps finds your current location</p> <p data-bbox="375 993 854 1020">Maps estimates where you are from sources like:</p> <ul data-bbox="375 1043 1468 1188" style="list-style-type: none"> • GPS: This uses satellites and knows your location up to around 20 meters. Note: When you're inside buildings or underground, the GPS is sometimes inaccurate. • Wi-Fi: The location of nearby Wi-Fi networks helps Maps know where you are. • Cell tower: Your connection to a cellular network can be accurate up to a few thousand meters. <p data-bbox="358 1201 1494 1262">Attachment 46 (Find and improve your location's accuracy - Android - Google Maps Help) at 1.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="370 247 610 279">From your devices</p> <p data-bbox="370 306 1479 447">Many devices, like phones or computers, can work out their precise location. You can allow Google and other apps to provide you with useful features based on where your device is located. For example, if you're running late to meet your friends, you'll probably want to use a navigation app to know the quickest way to get to your destination. To get turn-by-turn directions, you may need to turn on your device's location and give the app the permission to access it. Or for some searches like "coffee shop", "bus stop" or "atm", results will usually be more helpful when precise location is available.</p> <p data-bbox="370 491 1463 611">On your Android device, if you choose to turn on your device location, you can use features like navigation, giving an app access to your current location, or find your phone. You can also choose which apps have permission to use your device's location with simple controls that let you turn the permission on or off for individual apps. On Android, you can see when an app is requesting to use your phone's GPS-based location when the top of your screen shows Location  Learn more</p> <p data-bbox="430 636 670 667">Google Location Services</p> <p data-bbox="430 699 1419 903">On most Android devices, Google, as the network location provider, provides a location service called Google Location Services (GLS), known in Android 9 and above as Google Location Accuracy. This service aims to provide a more accurate device location and generally improve location accuracy. Most mobile phones are equipped with GPS, which uses signals from satellites to determine a device's location – however, with Google Location Services, additional information from nearby Wi-Fi, mobile networks, and device sensors can be collected to determine your device's location. It does this by periodically collecting location data from your device and using it in an anonymous way to improve location accuracy.</p> <p data-bbox="430 945 1414 1056">You can disable Google Location Services at any time in your device's location settings. Your device's location will continue to work even if GLS is turned off, but the device will rely only on GPS to estimate device location for apps with the necessary permission. Google Location Services is distinct from your device's location setting. Learn more</p> <p data-bbox="370 1102 1458 1186">The settings and permissions on Android control whether your device sensors (like GPS) or network-based location (like GLS) are used to determine your location and which apps have access to that location. They do not impact how websites and apps might estimate your location in other ways, such as from your IP Address.</p> <p data-bbox="358 1213 1458 1276">Attachment 44 (How Google uses location information – Privacy & Terms – Google) at 2 &3.</p>

Wireless communication device receive the location of the Wireless communication device (Exhibit B) on Google Map from Wireless communication networks (e.g. Verizon, AT&T, T-Mobile, etc.)

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="378 226 1182 264">Turn your phone's location accuracy on or off</p> <ol data-bbox="378 285 1109 394" style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Location > Advanced > Google Location Accuracy. 3. Turn Improve Location Accuracy on or off. <hr data-bbox="378 415 1528 420"/> <p data-bbox="407 447 922 478">When Google Location Accuracy is on</p> <p data-bbox="443 516 1523 579">When you have Google Location Accuracy turned on, your phone uses these sources to get location:</p> <ul data-bbox="443 604 683 758" style="list-style-type: none"> • GPS • Wi-Fi • Mobile networks • Sensors <hr data-bbox="378 810 1528 814"/> <p data-bbox="407 842 927 873">When Google Location Accuracy is off</p> <p data-bbox="443 911 1523 974">When you turn off Google Location Accuracy, your phone uses only GPS to find location. GPS is less accurate than other sources.</p> <p data-bbox="378 1077 1304 1115">Let your phone scan for nearby networks or devices</p> <p data-bbox="378 1136 1523 1167">To help apps get better location info, you can let your phone scan for nearby Wi-Fi access points</p> <ol data-bbox="378 1188 1040 1297" style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Location > Wi-Fi and Bluetooth scanning. 3. Turn Wi-Fi scanning or Bluetooth scanning on or off. <p data-bbox="358 1339 1179 1371">Attachment 21 (Manage your Pixel phone's location settings) at 2.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="375 239 862 268">If you use an older Android version</p> <p data-bbox="394 296 753 317">Choose location settings (Android 9.0) ^</p> <p data-bbox="417 342 647 361">To change location settings:</p> <ol data-bbox="423 373 792 441" style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Security & Location > Location. <ul style="list-style-type: none"> • If you have a work profile, tap Advanced. <p data-bbox="417 453 612 472">Then, choose an option:</p> <ul data-bbox="423 485 1260 592" style="list-style-type: none"> • Turn Location on or off: Tap Location. • Scan for nearby networks: Tap Advanced > Scanning. Turn Wi-Fi scanning or Bluetooth scanning on or off. • Turn emergency location service on or off: Tap Advanced > Google Emergency Location Service. Turn Emergency Location Service on or off. <p data-bbox="394 642 777 663">Choose location mode (Android 4.4–8.1) ^</p> <p data-bbox="417 686 1062 705">You can choose your location mode based on accuracy, speed, and battery use.</p> <ol data-bbox="423 718 1161 785" style="list-style-type: none"> 1. Open your phone's Settings app. 2. Tap Security & Location > Location. If you don't see "Security & Location," tap Location. 3. Tap Mode. Then pick: <ul data-bbox="446 791 1247 917" style="list-style-type: none"> • High accuracy: Use GPS, Wi-Fi, mobile networks, and sensors to get the most accurate location. Use Google Location Services to help estimate your phone's location faster and more accurately. • Battery saving: Use sources that use less battery, like Wi-Fi and mobile networks. Use Google Location Services to help estimate your phone's location faster and more accurately. • Device only: Use only GPS. Don't use Google Location Services to provide location information. This can estimate your phone's location more slowly and use more battery. <p data-bbox="394 968 790 989">Choose location access (Android 4.1–4.3) ^</p> <p data-bbox="417 1012 927 1031">You can control what location information your phone can use.</p> <ol data-bbox="423 1043 940 1113" style="list-style-type: none"> 1. Open your phone's Settings app. 2. Under "Personal," tap Location access. 3. At the top of the screen, turn Access to my location on or off. <ul data-bbox="446 1117 1252 1266" style="list-style-type: none"> • When location access is on, pick either or both of: <ul style="list-style-type: none"> • GPS satellites: Lets your phone estimate its location from satellite signals, like a GPS device in a car. • Wi-Fi & mobile network location: Lets your phone use Google Location Services to help estimate its location faster, with or without GPS. • When location access is off: <p data-bbox="464 1247 1002 1266">Your phone can't find its precise location or share it with any apps.</p> <p data-bbox="417 1278 1261 1316">Tip: If you have a tablet that more than one person uses, each person can have different location access settings.</p> <p data-bbox="358 1344 1234 1373">Attachment 40 (Manage your Pixel phone's location settings) at 3 & 4.</p>

Claim 1	Corresponding Structure in Accused Systems
	<ol style="list-style-type: none"> 1. On your Android device, go to Settings 2. Tap Location and re-enable your location services 3. Select Mode High accuracy <div data-bbox="933 247 1448 399" style="border: 1px solid black; border-radius: 10px; padding: 5px; margin: 10px 0;"> <p>The user of the wireless device can select the method of the location estimation</p> </div>  <p>On some phone models, this option can be found under the Advanced Settings option.</p> <p>Select Advanced Settings and enable your device to improve positioning accuracy by allowing apps to scan for Wi-Fi networks and Bluetooth devices at any time, even if Wi-Fi or Bluetooth is disabled.</p>  <p>Attachment 33 (Google Maps Not Updating Location) at 4.</p>

Claim 1**Corresponding Structure in Accused Systems**

	DESCRIPTION	OPT-IN / OPT-OUT	USER CHOICES
LOCATION SERVICES	"Use Google's location service to help apps determine your location. Anonymous location data will be sent to Google when your device is on."	Opt-Out	"YES, I'M IN" or "SKIP"
LOCATION ACCURACY	Three Modes: "High accuracy", "Battery saving", and "Device only". Default setting: "High accuracy use(s) GPS, Wi-Fi, Bluetooth, or cellular networks to determine location"	Opt-Out	Toggle icon (right and colored for on, left and gray for off). This setting not shown during Android set-up.
LOCATION SCANNING	"Improve location accuracy by allowing apps and services to scan for Wi-Fi and Bluetooth, even when those settings are off."	Opt-Out	Toggle icon (right and colored for on, left and gray for off).
LOCATION HISTORY	"[A]llows Google to store a history of your location data from all devices where you are logged into your Google Account and have enabled Location Reporting. Location History and Location Reporting data may be used by any Google app or service."	Opt-Out	"YES, I'M IN" or "NO THANKS" In the context of "Give your new Assistant permission to help you"

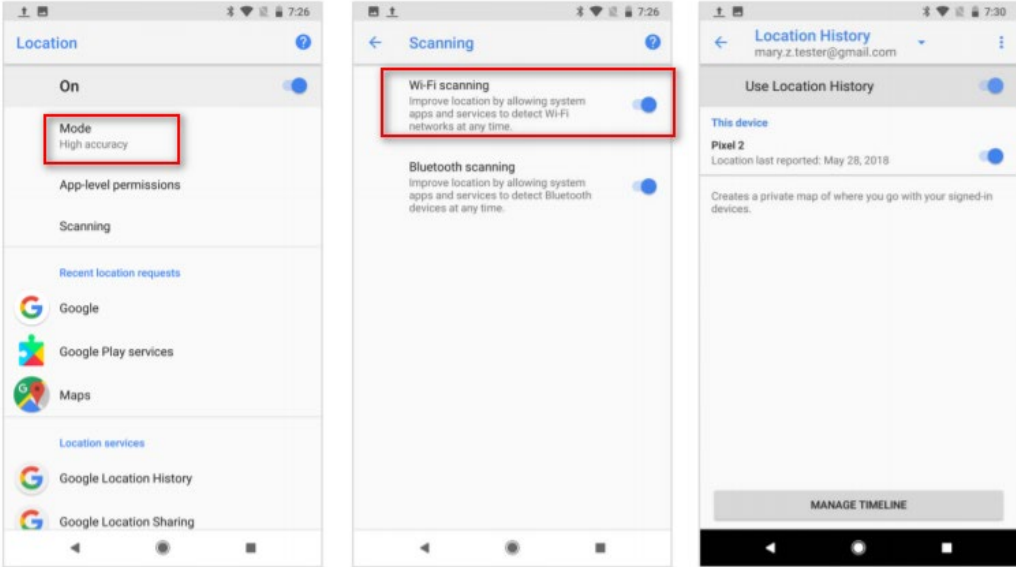
Figure 1: Four Android settings and services that relate to location information collection.¹

Google Location Services

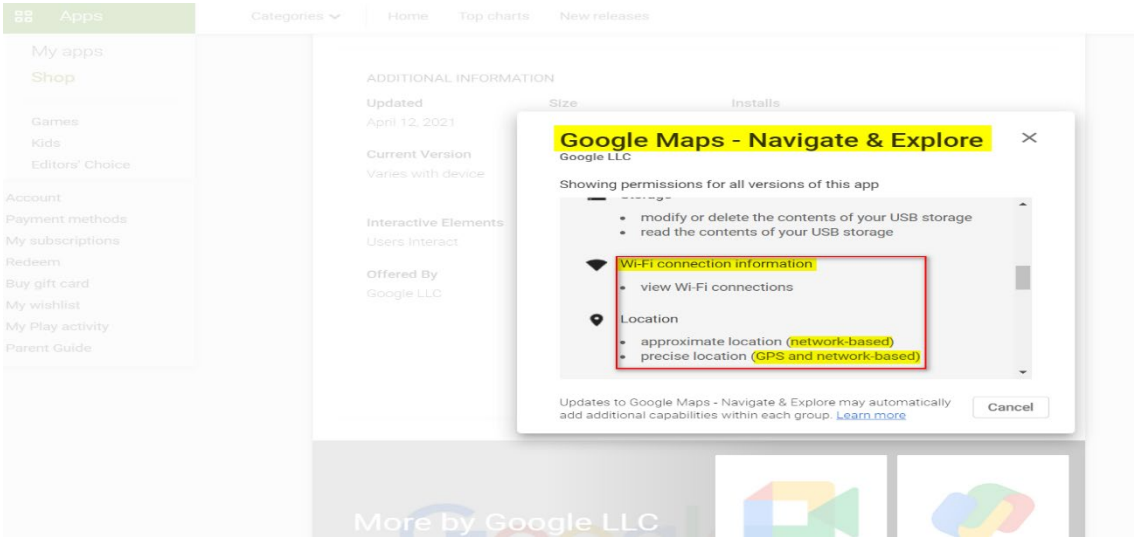
Google Location Services (GLS) operate at a device level and rely on sensors such as GPS, Wi-Fi, the cellular radio, and other technologies included in mobile devices to position a user in the world. If a user keeps the default settings prompted by Google, Location Services is enabled, Location Accuracy will be set to "High Accuracy"² and Location Scanning will be enabled for both Wi-Fi base stations and Bluetooth Beacons, regardless of a user's choice to turn Wi-Fi or Bluetooth on. The implications of user choices among the various Location Services settings are significant, but not intuitive, including:

- With Location Services turned on, Location Accuracy set to "Device only" and Location Scanning turned off, an Android device will only use GPS to provide the location of an Android device.
- When Location Accuracy is set to "High accuracy" and Location Scanning is enabled (the default setting for new device setup), an Android device will use sources including Wi-Fi, Bluetooth, and cellular radio to improve the accuracy of the device's position.

Attachment 38 (Google, Android and Location Tracking) at 2.

Claim 1	Corresponding Structure in Accused Systems
	<p>After completing the setup process users can validate and control settings for device location via the Settings app and navigating to Google settings, then Location (Figure 4).</p>  <p>Figure 4: Location settings after Android device setup process</p> <p>As demonstrated in Figure 4, if users accept Google's defaults during the setup process, the Android device is configured with Location Services enabled, Wi-Fi and Bluetooth scanning engaged, and Location History active.</p> <p>Attachment 38 (Google, Android and Location Tracking) at 5.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p>Users can choose to disable GLS during the set-up process. However, if a user attempts to disable GLS, a warning dialogue box prompts an extreme scenario: “device location for all apps is turned off and you may not be able to locate your device if it is lost.” (Figure 5) Note as well, the action prompt is to “Turn on Location” – reversing the user choice triggering the warning. Further, as described immediately below, many Google and third party apps will not function unless GLS is turned on. Therefore, Google forces user into an impossible ultimatum, have their every move constantly monitored, tracked, and stored or lose the functionality of their expensive smartphone.</p> <p>If a user disables Location Services but then attempts to use a location aware app or service on their device, she will see the dialogue box shown in Figure 6. If the user clicks “OK” the service is enabled for the entire device and permanently, rather than enabling Location Services only for that particular app or service requesting the functionality.</p> <div data-bbox="516 604 833 1081" data-label="Image"> </div> <div data-bbox="516 1087 833 1110" data-label="Caption"> <p>Figure 5: Location Services Warning</p> </div> <div data-bbox="925 604 1250 1081" data-label="Image"> </div> <div data-bbox="963 1087 1214 1131" data-label="Caption"> <p>Figure 6: Re-Enable Location Services</p> </div> <p>Attachment 38 (Google, Android and Location Tracking) at 6.</p> <p>We collect information about your location when you use our services, which helps us offer features like driving directions for your weekend getaway or showtimes for movies playing near you.</p> <p>Your location can be determined with varying degrees of accuracy by:</p> <ul style="list-style-type: none"> • GPS • IP address • Sensor data from your device • Information about things near your device, such as Wi-Fi access points, cell towers, and Bluetooth-enabled devices <p>The types of location data we collect depend in part on your device and account settings. For example, you can turn your Android device's location on or off using the device's settings app. You can also turn on Location History if you want to create a private map of where you go with your signed-in devices.</p> <p>Attachment 29 (Google Privacy Policy) at 4.</p>

Claim 1	Corresponding Structure in Accused Systems
	 <p>Attachment 39 (Google Map_Permissions) at 1.</p> <p>Overview ↑</p> <div style="border: 2px solid red; padding: 10px; margin: 10px 0;"> <p>The Google Maps Geolocation API returns a location and accuracy radius based on information about cell towers and WiFi nodes that the mobile client can detect. This document describes the protocol used to send this data to the server and to return a response to the client.</p> </div> <p>Communication is done over HTTPS using POST. Both request and response are formatted as JSON, and the content type of both is <code>application/json</code>.</p> <p>Attachment 17 (Cell Towers/Wi-Fi Nodes (RF transceivers) in a wireless communication network) at 1.</p> <p>Knowing where the user is allows your application to be smarter and deliver better information to the user. When developing a location-aware application for Android, you can utilize GPS and Android's Network Location Provider to acquire the user location. Although GPS is most accurate, it only works outdoors, it quickly consumes battery power, and doesn't return the location as quickly as users want. Android's Network Location Provider determines user location using cell tower and Wi-Fi signals, providing location information in a way that works indoors and outdoors, responds faster, and uses less battery power. To obtain the user location in your application, you can use both GPS and the Network Location Provider, or just one.</p> <p>Attachment 12 (Location of the device determined using cell tower) at 1&2.</p>

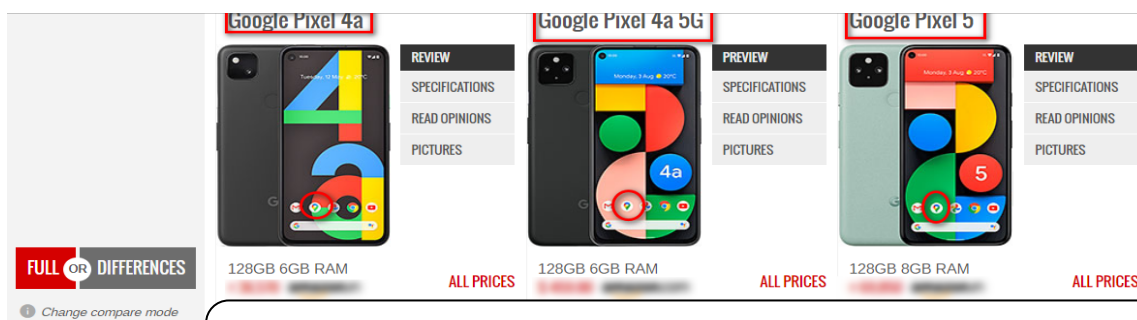
Claim 1	Corresponding Structure in Accused Systems
	<p>The first parameter in <code>requestLocationUpdates()</code> is the type of location provider to use (in this case, the Network Location Provider for cell tower and Wi-Fi based location). You can control the frequency at which your listener receives updates with the second and third parameter—the second is the minimum time interval between notifications and the third is the minimum change in distance between notifications—setting both to zero requests location notifications as frequently as possible. The last parameter is your <code>LocationListener</code>, which receives callbacks for location updates.</p> <p>To request location updates from the GPS provider, use <code>GPS_PROVIDER</code> instead of <code>NETWORK_PROVIDER</code>. You can also request location updates from both the GPS and the Network Location Provider by calling <code>requestLocationUpdates()</code> twice—once for <code>NETWORK_PROVIDER</code> and once for <code>GPS_PROVIDER</code>.</p> <div data-bbox="760 562 1523 714" style="border: 1px solid black; padding: 5px;"> <p>Google Maps application makes use of wireless communication network, having cell towers (Exhibit A) or Wi-Fi access points (Exhibit A), to estimate the location of the Wireless communication device (Exhibit B).</p> </div> <h3 data-bbox="375 600 743 653">Requesting User Permissions</h3> <p>In order to receive location updates from <code>NETWORK_PROVIDER</code>, <code>ACCESS_COARSE_LOCATION</code> or <code>ACCESS_FINE_LOCATION</code> permission, respectively, in your Android manifest file. Without these permissions, your application will fail at runtime when requesting location updates.</p> <p>If you are using both <code>NETWORK_PROVIDER</code> and <code>GPS_PROVIDER</code>, then you need to request only the <code>ACCESS_FINE_LOCATION</code> permission, because it includes permission for both providers. Permission for <code>ACCESS_COARSE_LOCATION</code> allows access only to <code>NETWORK_PROVIDER</code>.</p> <h3 data-bbox="358 974 1328 1005">Attachment 12 (Location is estimated using cell tower/wi-fi network) at 3 & 4.</h3> <p data-bbox="386 1043 740 1066">Flow for obtaining user location</p> <p data-bbox="386 1087 992 1110">Here's the typical flow of procedures for obtaining the user location:</p> <ol data-bbox="418 1129 1227 1297" style="list-style-type: none"> 1. Start application. 2. Sometime later, start listening for updates from desired location providers. 3. Maintain a "current best estimate" of location by filtering out new, but less accurate fixes. 4. Stop listening for location updates. 5. Take advantage of the last best location estimate. <p data-bbox="386 1316 1446 1362">Figure 1 demonstrates this model in a timeline that visualizes the period in which an application is listening for location updates and the events that occur during that time.</p> <div data-bbox="375 1367 1422 1614" style="border: 2px solid red; padding: 10px;"> <p>The diagram is a horizontal timeline labeled 'Time (t)' at the right end. It shows a sequence of events: 'Application starts' (vertical line), 'Listen for GPS and Network updates' (vertical line), 'Cached network location is retrieved' (green dot), 'Cached GPS location is dismissed as too old' (red X), 'New Cell-ID fix is received' (green dot), 'A WiFi-based location is obtained' (green dot), 'New WiFi-based location is dismissed due to larger error estimates' (red X), 'A GPS location replaces current best estimate' (green dot), 'Stop listening for updates' (green dot), and 'Best estimate of the location is used in the application' (vertical line).</p> </div> <h3 data-bbox="358 1646 1273 1677">Attachment 12 (Location is estimated using cell tower/wi-fi network) at 5.</h3>

Claim 1	Corresponding Structure in Accused Systems
	<p>There are 3 location providers in Android.</p> <p>They are:</p> <p>gps → (GPS, AGPS): Name of the GPS location provider. This provider determines location using satellites. Depending on conditions, this provider may take a while to return a location fix. Requires the permission <code>android.permission.ACCESS_FINE_LOCATION</code>.</p> <p>network → (AGPS, CellID, WiFi MACID): Name of the network location provider. This provider determines location based on availability of cell tower and WiFi access points. Results are retrieved by means of a network lookup. Requires either of the permissions <code>android.permission.ACCESS_COARSE_LOCATION</code> or <code>android.permission.ACCESS_FINE_LOCATION</code>.</p> <p>passive → (CellID, WiFi MACID): A special location provider for receiving locations without actually initiating a location fix. This provider can be used to passively receive location updates when other applications or services request them without actually requesting the locations yourself. This provider will return locations generated by other providers. Requires the permission <code>android.permission.ACCESS_FINE_LOCATION</code>, although if the GPS is not enabled this provider might only return coarse fixes. This is what Android calls these location providers, however, the underlying technologies to make this stuff work is mapped to the specific set of hardware and telco provided capabilities (network service).</p> <p>The best way is to use the “network” or “passive” provider first, and then fallback on “gps”, and depending on the task, switch between providers. This covers all cases, and provides a lowest common denominator service (in the worst case) and great service (in the best case).</p> <p>Attachment 41 (Android Location Providers - GPS or Network Provider?) at 1 & 2.</p> <p>Accuracy</p> <p>You can specify location accuracy using the <code>setPriority()</code> method, passing one of the following values as the argument:</p> <ul style="list-style-type: none"> PRIORITY_HIGH_ACCURACY provides the most accurate location possible, which is computed using as many inputs as necessary (it enables GPS, Wi-Fi, and cell, and uses a variety of Sensors), and may cause significant battery drain. PRIORITY_BALANCED_POWER_ACCURACY provides accurate location while optimizing for power. Very rarely uses GPS. Typically uses a combination of Wi-Fi and cell information to compute device location. PRIORITY_LOW_POWER largely relies on cell towers and avoids GPS and Wi-Fi inputs, providing coarse (city-level) accuracy with minimal battery drain. PRIORITY_NO_POWER receives locations passively from other apps for which location has already been computed. <p>The location needs of most apps can be satisfied using the balanced power or low power options. High accuracy should be reserved for apps that are running in the foreground and require <i>real time</i> location updates (for example, a mapping app).</p> <p>Attachment 42 (Optimize location for battery) at 2.</p> <p>Traffic conditions [edit]</p> <p>In 2007, Google began offering traffic data as a colored overlay on top of roads and motorways to represent the speed of vehicles on particular roads. Crowdsourcing is used to obtain the GPS-determined locations of a large number of cellphone users, from which live traffic maps are produced.^{[59][60][61]}</p> <p>Google has stated that the speed and location information it collects to calculate traffic conditions is anonymous.^[62] Options available in each phone's settings allow users not to share information about their location with Google Maps.^[63] Google stated, "Once you disable or opt out of My Location, Maps will not continue to send radio information back to Google servers to determine your handset's approximate location".^{[64][failed verification]}</p> <p>Attachment 43 (Google Maps Wikipedia) at 5 & 6.</p>

Claim 1	Corresponding Structure in Accused Systems
<p>according to mapping information stored within the wireless mobile communications device,</p>	<p>Plaintiff contends the Exhibit-B-listed mobile-wireless-communications device's motherboard processor is programmed to process location-service information; i.e., to receive a location of the device from the wireless communications network and generate an indication of the device's location.</p> <p>For example, the motherboard processor may use Google Maps to obtain the device's location and provide direction from that location to a destination. Wireless mobile communication device-including but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list) has a processor for example, Quad-Core processor. When wireless communication device transceivers and processor are in communication, they are coupled. Further, the Location-based Service (LBS) provider, such as Google Map, on the Exhibit-B utilizes the processor coupled to the transceiver to estimates/receive the location on mobile wireless communications devices (specifically one or more of the mobile wireless communications devices identified on Exhibit B) by utilizing wireless communication network or first computer.</p> <p>For example, the motherboard processor may use Google Maps to view and find places around the globe. Google map can also show your current location and provide direction (including with respect to geographic features such as nearby restaurants) from your location/source to any destination. In using Google Maps App, the mobile wireless communication device's motherboard processor generates signals for displaying on the device's screen a blue dot that shows the current location of the wireless mobile communication device. The Google map app estimates the location of the device from 3 sources: GPS (GPS uses satellites and knows your location within a few meters), Wi-Fi (the location of nearby Wi-Fi networks helps Maps know where you are), and cell towers (cell tower can be accurate up to a few thousand meters). When Google Maps isn't sure about your location, a light blue circle around the blue dot is shown. You might be anywhere within the light blue circle. The smaller the circle, the more certain the app is about your location.</p> <p>Furthermore, Plaintiff contends Google Maps App provides flexibility to download maps on SD card/internal memory of communication device (Exhibit B) examples of compatible devices is Samsung Galaxy S20, Pixel 4a, Pixel 4a 5G, Pixel 5, etc., and navigate offline. When internet is slow or mobile data is expensive, or communication device cannot connect to internet, an area can be saved to phone or tablet (Exhibit B) from Google maps app and use it when offline. Communication device can use Offline maps for Navigation through the downloaded area without internet.</p> <p>The following exemplifies the existence of this limitation in Accused Systems:</p>

Claim 1

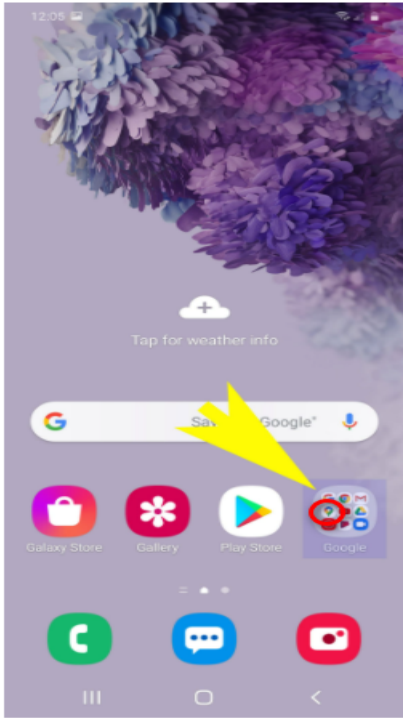
Corresponding Structure in Accused Systems



Preloaded application Google Map on the Wireless mobile device utilizes the processor coupled to the transceiver to estimates/receive the location on mobile wireless communications device by utilizing wireless communication network

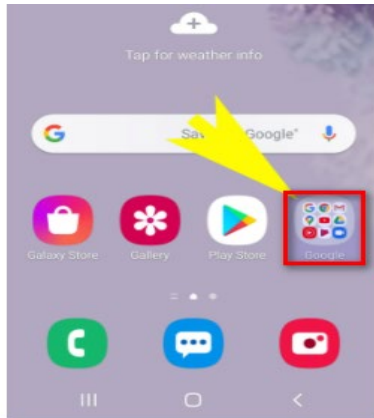
NETWORK	Technology	GSM / HSPA / LTE	GSM / HSPA / LTE / 5G	GSM / CDMA / HSPA / EVDO / LTE / 5G
LAUNCH	Announced	2020, August 03	2020, September 30	2020, September 30
	Status	Available. Released 2020, August 20	Available. Released 2020, November 05	Available. Released 2020, October 15
BODY	Dimensions	144 x 69.4 x 8.2 mm (5.67 x 2.73 x 0.32 in)	153.9 x 74 x 8.2 mm (Sub-6) or 8.5 mm (Sub-6 and mmWave)	144.7 x 70.4 x 8 mm (5.70 x 2.77 x 0.31 in)
	Weight	143 g (5.04 oz)	168 g (5G Sub-6); 171 g (5G Sub-6 and mmWave) (5.93 oz)	151 g (5.33 oz)
	Build	Glass front (Gorilla Glass 3), plastic back, plastic frame	Glass front (Gorilla Glass 3), plastic back, plastic frame	Glass front (Gorilla Glass 6), aluminum back, aluminum frame
	SIM	Nano-SIM and/or eSIM	Nano-SIM and/or eSIM	Nano-SIM and/or eSIM
				IP68 dust/water resistant (up to 1.5m for 30 mins)
DISPLAY	Type	OLED, HDR	OLED, HDR	OLED, 90Hz, HDR10+
	Size	5.81 inches, 83.2 cm ² (~83.3% screen-to-body ratio)	6.2 inches, 95.7 cm ² (~84.1% screen-to-body ratio)	6.0 inches, 87.6 cm ² (~85.9% screen-to-body ratio)
	Resolution	1080 x 2340 pixels, 19.5:9 ratio (~443 ppi density)	1080 x 2340 pixels, 19.5:9 ratio (~413 ppi density)	1080 x 2340 pixels, 19.5:9 ratio (~432 ppi density)
	Protection	Corning Gorilla Glass 3	Corning Gorilla Glass 3	Corning Gorilla Glass 6
		Always-on display	Always-on display	Always-on display
PLATFORM	OS	Android 10, upgradable to Android 11	Android 11	Android 11
	Chipset	Qualcomm SDM730 Snapdragon 730G (8 nm)	Qualcomm SM7250 Snapdragon 765G (7 nm)	Qualcomm SM7250 Snapdragon 765G (7 nm)
	CPU	Octa-core (2x2.2 GHz Kryo 470 Gold & 6x1.8 GHz Kryo 470 Silver)	Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)	Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)
	GPU	Adreno 618	Adreno 620	Adreno 620

Attachment 4 (Processor of Google Pixel 4a, Pixel 4a 5G and Pixel 5) at 1.

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="370 254 1518 289">Using Turn-by-Turn Navigation with the Galaxy S20 Google Maps</p> <p data-bbox="370 312 643 336">Time Needed : 8 minutes</p> <p data-bbox="370 367 1518 420">The following steps demonstrate the actual process of setting up and utilizing turn-by-turn navigation system with the Google Maps app on the new Samsung Galaxy S20 handset.</p> <p data-bbox="370 422 1518 474">Before you begin, verify and ensure that location is enabled on your phone. It has to be enabled so that your device can determine your current location.</p> <p data-bbox="414 504 1036 527">1. Tap to open the Google folder from the Home screen.</p> <p data-bbox="436 531 1256 554">A new screen consisting of Google-related apps and services will be displayed.</p> <div data-bbox="436 579 837 1293">  <p>The screenshot shows a home screen with a purple floral wallpaper. At the top, there's a weather widget with a plus icon and the text 'Tap for weather info'. Below that is a Google search bar. In the dock, there are icons for Galaxy Store, Gallery, Play Store, and Google. A yellow arrow points to the Google icon in the dock.</p> </div> <p data-bbox="906 699 1409 819">Google Maps preloaded in the Wireless mobile communication devices (Exhibit B), such as Galaxy S20. Current location of the device is determined if location is enabled.</p> <p data-bbox="358 1325 1068 1356">Attachment 5 (how to use turn by turn Google map) at 1.</p>

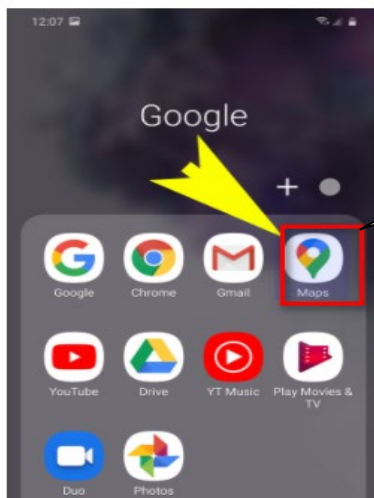
Claim 1

Corresponding Structure in Accused Systems



2. Tap Maps to open Google Maps app.

If this is the first time you use Google Maps on your Galaxy S20, you'll be prompted with a Welcome screen. If you see this screen, read and review the information then tap **GOT IT** to proceed.



Google Maps preloaded in the Wireless mobile communication devices (Exhibit B), such as Galaxy S20.

Attachment 5 (how to use turn by turn google map) at 2&3.



Personal Business

Shop Why Verizon Support

Home > Support > Sony > Sony Xperia Z2 > Google Maps - Find Current Location

Google Maps™ - Find Current Location

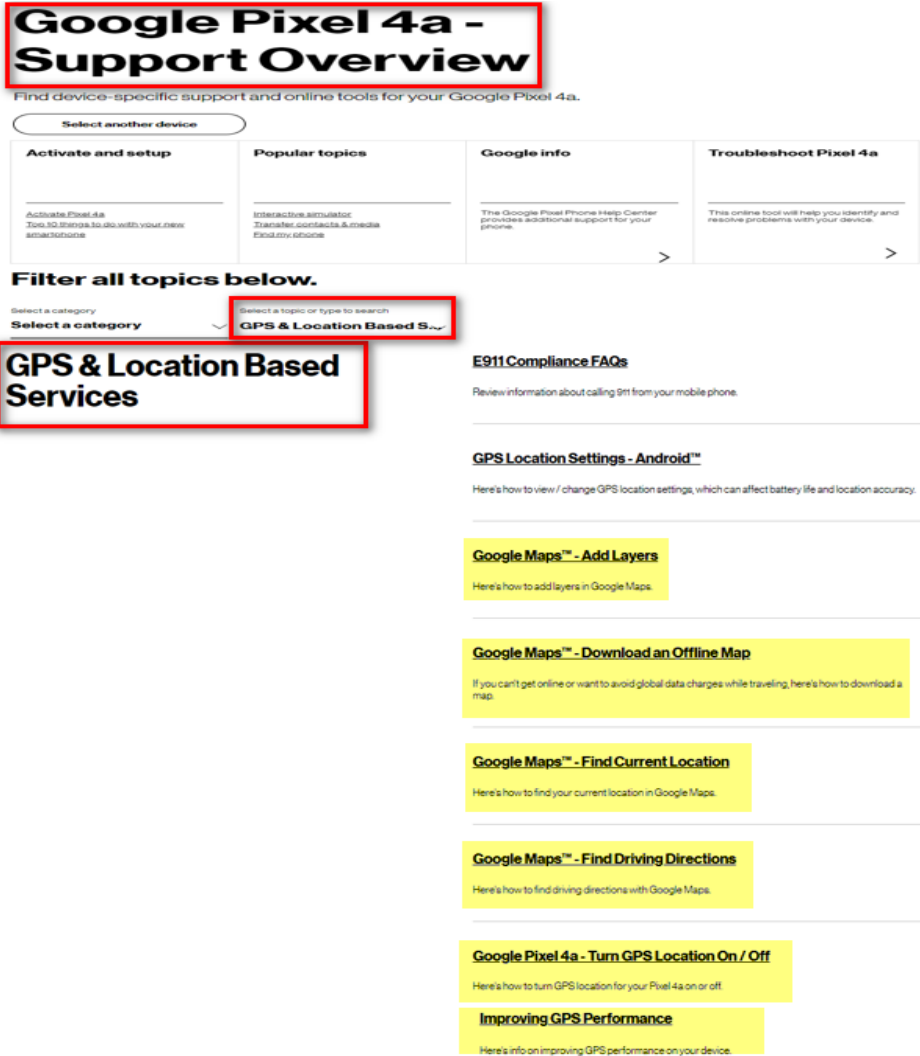
Notes:

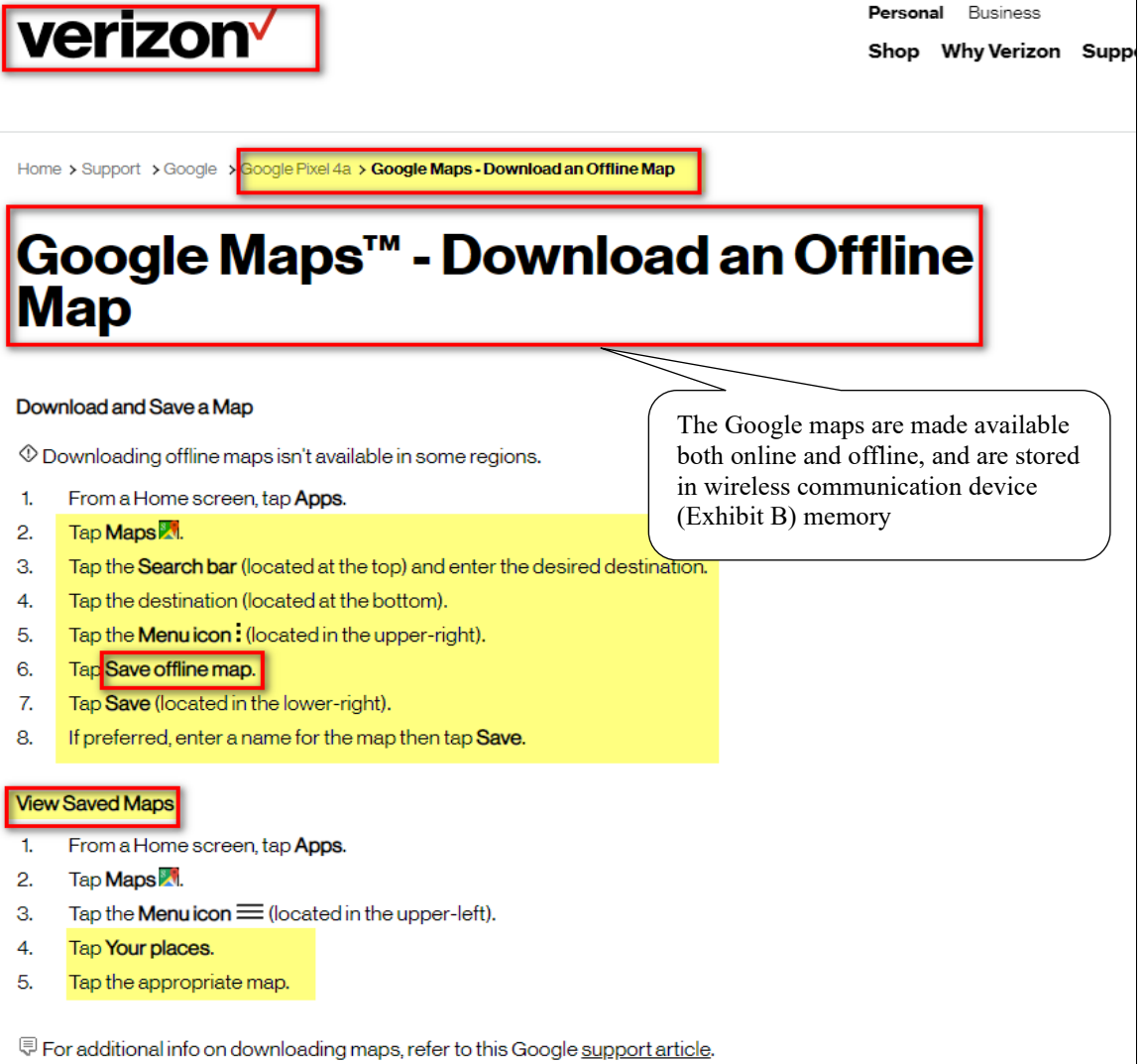
- If the Google Maps app isn't already installed on your device, it can be [downloaded](#) from the Google Play Store™.
- For further assistance, refer to the Google Maps [Help Center](#).

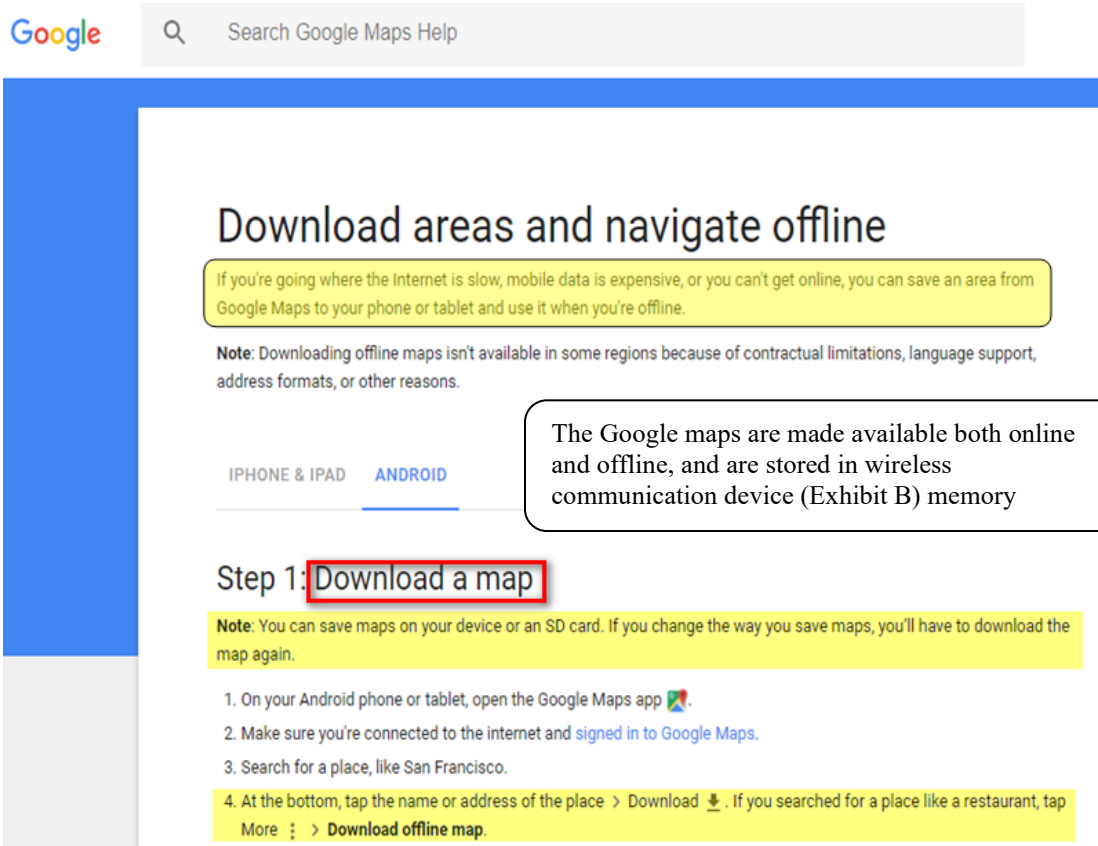



- From a Home screen, tap **Apps**.
- Tap **Maps**.
- Tap the **My Location icon** (located in the lower-right).





Wireless communication networks (e.g. Verizon, AT&T, T-Mobile, etc.) estimate/determine the location of the Wireless communication device (Exhibit B) on Google Maps.






Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="365 222 1105 254">Attachment 6 (Find Current Location on Google map) at 1.</p> <div data-bbox="378 317 1484 632">  <p data-bbox="378 317 1484 380">Google Search Google Maps Help</p> <h3 data-bbox="418 415 1141 457">How Maps finds your current location</h3> <p data-bbox="418 478 933 504">Maps estimates where you are from sources like:</p> <ul data-bbox="423 527 1442 632" style="list-style-type: none"> • GPS: This uses satellites and knows your location within a few meters. • Wi-Fi: The location of nearby Wi-Fi networks helps Maps know where you are. • Cell tower: Your connection to a cellular network can be accurate up to a few thousand meters. </div> <p data-bbox="358 663 1081 695">Attachment 8 (How map finds your current location) at 2.</p> <div data-bbox="365 716 1451 1037">  <h3 data-bbox="391 726 781 758">What the blue dot means</h3> <p data-bbox="391 779 1421 852">The blue dot shows you where you are on the map. When Google Maps isn't sure about your location, you'll see a light blue circle around the blue dot. You might be anywhere within the light blue circle. The smaller the circle, the more certain the app is about your location.</p> <p data-bbox="391 873 448 890">Notes:</p> <ul data-bbox="391 911 1398 1016" style="list-style-type: none"> • If the blue dot is not showing, or the dot is gray, this means that we can't find your current location and we're showing you the last location you visited. • If there's something between you and cell towers, like a parking garage or tall buildings, your blue dot might not be accurate. </div> <p data-bbox="358 1058 1101 1089">Attachment 8 (Current location shown on google map) at 3.</p> <div data-bbox="365 1110 1471 1604">  <p data-bbox="365 1115 1471 1178">The following screenshot shows the My Location button at top right and the My Location blue dot in the center of the map:</p> <p data-bbox="797 1178 1195 1205">Blue Dot indicating location the map</p> <p data-bbox="805 1272 1263 1423">Processor of the wireless communication device estimated the location of the wireless communication device (Exhibit B) from wireless communication network. The Blue dot showing estimated location.</p> <p data-bbox="794 1497 1414 1524">Geographical features cities, streets, etc., on Google Maps</p> </div> <p data-bbox="358 1625 1159 1656">Source: Location estimation on the Wireless communication device</p> <p data-bbox="358 1677 1382 1709">Attachment 22 (Location estimation on the Wireless communication device) at 10.</p>

Claim 1	Corresponding Structure in Accused Systems
	 <p>Google Pixel 4a - Support Overview</p> <p>Find device-specific support and online tools for your Google Pixel 4a.</p> <p>Select another device</p> <p>Activate and setup</p> <p>Activate Pixel 4a Too slow? Set up with your new smartphone</p> <p>Popular topics</p> <p>Interactive tutorial Transfer contacts & media Find my phone</p> <p>Google info</p> <p>The Google Pixel Phone Help Center provides additional support for your phone.</p> <p>Troubleshoot Pixel 4a</p> <p>This online tool will help you identify and resolve problems with your device.</p> <p>Filter all topics below.</p> <p>Select a category Select a topic or type to search</p> <p>Select a category</p> <p>GPS & Location Based Services</p> <p>GPS & Location Based Services</p> <p>E911 Compliance FAQs</p> <p>Review information about calling 911 from your mobile phone.</p> <p>GPS Location Settings - Android™</p> <p>Here's how to view / change GPS location settings, which can affect battery life and location accuracy.</p> <p>Google Maps™ - Add Layers</p> <p>Here's how to add layers in Google Maps.</p> <p>Google Maps™ - Download an Offline Map</p> <p>If you can't get online or want to avoid global data charges while traveling, here's how to download a map.</p> <p>Google Maps™ - Find Current Location</p> <p>Here's how to find your current location in Google Maps.</p> <p>Google Maps™ - Find Driving Directions</p> <p>Here's how to find driving directions with Google Maps.</p> <p>Google Pixel 4a - Turn GPS Location On / Off</p> <p>Here's how to turn GPS location for your Pixel 4a on or off.</p> <p>Improving GPS Performance</p> <p>Here's info on improving GPS performance on your device.</p> <p>Attachment 16 (How to use Pixel 4a GPS and location-based services) at 9.</p>

Claim 1	Corresponding Structure in Accused Systems
	 <p>verizon Personal Business Shop Why Verizon Supp</p> <p>Home > Support > Google > Google Pixel 4a > Google Maps - Download an Offline Map</p> <h2>Google Maps™ - Download an Offline Map</h2> <p>Download and Save a Map</p> <p>◇ Downloading offline maps isn't available in some regions.</p> <ol style="list-style-type: none"> 1. From a Home screen, tap Apps. 2. Tap Maps. 3. Tap the Search bar (located at the top) and enter the desired destination. 4. Tap the destination (located at the bottom). 5. Tap the Menu icon (located in the upper-right). 6. Tap Save offline map. 7. Tap Save (located in the lower-right). 8. If preferred, enter a name for the map then tap Save. <p>View Saved Maps</p> <ol style="list-style-type: none"> 1. From a Home screen, tap Apps. 2. Tap Maps. 3. Tap the Menu icon (located in the upper-left). 4. Tap Your places. 5. Tap the appropriate map. <p>For additional info on downloading maps, refer to this Google support article.</p> <p>Attachment 10 (Google Map-Download an offline map on pixel 4a) at 1.</p>

Claim 1	Corresponding Structure in Accused Systems
	 <p data-bbox="358 233 1450 296">Google Search Google Maps Help</p> <h2 data-bbox="573 428 1239 480">Download areas and navigate offline</h2> <p data-bbox="573 495 1390 548">If you're going where the Internet is slow, mobile data is expensive, or you can't get online, you can save an area from Google Maps to your phone or tablet and use it when you're offline.</p> <p data-bbox="573 569 1390 621">Note: Downloading offline maps isn't available in some regions because of contractual limitations, language support, address formats, or other reasons.</p> <p data-bbox="573 688 802 716">IPHONE & IPAD ANDROID</p> <h3 data-bbox="573 785 898 827">Step 1: Download a map</h3> <p data-bbox="573 842 1425 894">Note: You can save maps on your device or an SD card. If you change the way you save maps, you'll have to download the map again.</p> <ol data-bbox="573 915 1425 1066" style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. Make sure you're connected to the internet and signed in to Google Maps. 3. Search for a place, like San Francisco. 4. At the bottom, tap the name or address of the place > Download . If you searched for a place like a restaurant, tap More  > Download offline map. <p data-bbox="358 1094 1401 1121">Attachment 9 (Mapping information stored on wireless communication device) at 1.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="412 258 594 287">Save a route</p> <ol data-bbox="435 300 1328 541" style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. Make sure you're connected to the Internet. 3. Search for your destination or tap it on the map. 4. In the bottom left, tap Directions . 5. From the top, choose your mode of transit. 6. Tap the white bar at the bottom. It's the one that shows the travel time and distance. 7. At the bottom, tap Save offline. <p data-bbox="423 562 467 590">Tip:</p> <ul data-bbox="428 611 1495 737" style="list-style-type: none"> • Your route is saved on your phone or tablet. Make sure to use the same phone or tablet when looking for a saved route. • Your saved route expires after 30 days. • Your route will show you the same mode of transit you chose when you saved the route. <p data-bbox="412 768 656 798">Find a saved route</p> <ol data-bbox="435 810 1122 873" style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. At the bottom, tap Saved offline route. <p data-bbox="423 894 467 921">Tip:</p> <ul data-bbox="428 942 1495 1094" style="list-style-type: none"> • If you save a route from "Your location" and look up a saved route, the directions will start from the place where you saved the route. The directions won't start from your current location. • To get updated information like traffic, tap Refresh . • Turn-by-turn navigation isn't currently available for saved routes. To search for places and get turn-by-turn navigation, download an offline area. <p data-bbox="358 1115 997 1144">Attachment 32 (Get directions & show routes) at 3.</p>

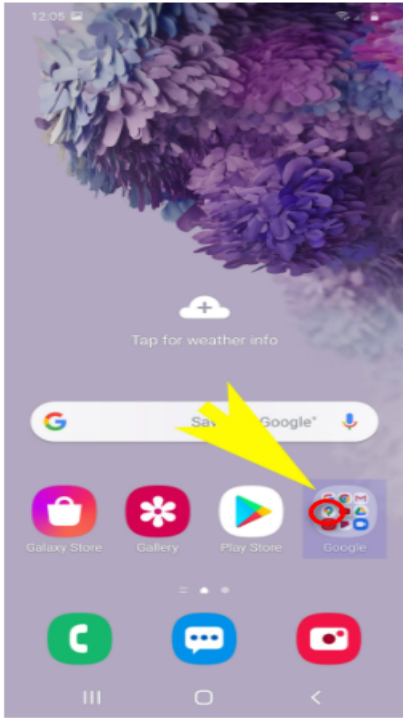
Claim 1	Corresponding Structure in Accused Systems
	<p>Use offline maps</p> <p>After you download an area, use the Google Maps app just like you normally would.</p> <ul style="list-style-type: none"> • Get directions and see routes • Use navigation • Search for locations <p>If your Internet connection is slow or absent, Google Maps will use your offline maps to give you directions.</p> <p>Notes:</p> <ul style="list-style-type: none"> • You can get driving directions offline, but not transit, bicycling, or walking directions. In your driving directions, you won't have traffic info, alternate routes, or lane guidance. • To save cell data and battery life, use "Wi-Fi only" mode. In this mode, when you're not connected to Wi-Fi, Google Maps will only use data from the offline maps that you've downloaded. Before you use this mode, make sure you download offline maps. To turn on this mode, tap your profile picture or initial  > Settings  > turn on Wi-Fi only. <p>Manage offline maps</p> <hr/> <p>See a list of your offline maps </p> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. Tap your profile picture or initial  > Offline maps. <p>You can select your own map to download, or view maps you've already downloaded.</p> <p>Attachment 31 (Download google map) at 2.</p>
<p>and wherein the first processor determines user navigation information and displays the user navigation information according to the location of the wireless mobile communications device with respect to the geographic features and a destination specified at the wireless mobile communications device,</p>	<p>Plaintiff contends the motherboard processor (i.e., processor on the motherboard) of each Exhibit-B-listed item (i.e., mobile Wireless communications device) meets this limitation. The processor processes location-service information, including displaying user navigation information according to the device's location with regards to geographic features and a user-specified Destination. For example, using Google map app for more examples of location services processed by each Exhibit-B device's motherboard processor) the device user locates the device's current location on the google map app and then provide details for a destination on the options, provided in the Google map app. The user can then navigate (i.e., the processor processes display information) in real time from current location to destination. The processor displays navigation in the Google Maps app to display turn-by-turn directions. Using the Google map app, the processor will show the directions and use real-time traffic information to find the best route to the specified destination.</p> <p>The following exemplifies this limitation's existence in Accused Systems:</p>

Claim 1**Corresponding Structure in Accused Systems**

Preloaded application Google Map on the Wireless mobile device utilizes the processor coupled to the transceiver to estimates/receive the location on mobile wireless communications device by utilizing wireless communication network

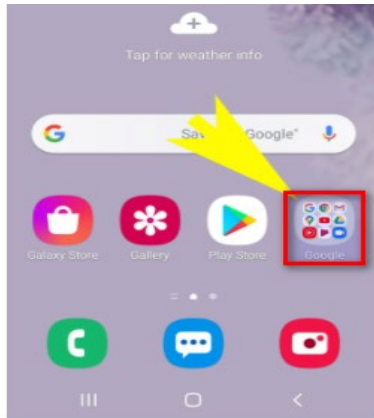
NETWORK	Technology	GSM / HSPA / LTE	GSM / HSPA / LTE / 5G	GSM / CDMA / HSPA / EVDO / LTE / 5G
LAUNCH	Announced	2020, August 03	2020, September 30	2020, September 30
	Status	Available. Released 2020, August 20	Available. Released 2020, November 05	Available. Released 2020, October 15
BODY	Dimensions	144 x 69.4 x 8.2 mm (5.67 x 2.73 x 0.32 in)	153.9 x 74 x 8.2 mm (Sub-6) or 8.5 mm (Sub-6 and mmWave)	144.7 x 70.4 x 8 mm (5.70 x 2.77 x 0.31 in)
	Weight	143 g (5.04 oz)	168 g (5G Sub-6); 171 g (5G Sub-6 and mmWave) (5.93 oz)	151 g (5.33 oz)
	Build	Glass front (Gorilla Glass 3), plastic back, plastic frame	Glass front (Gorilla Glass 3), plastic back, plastic frame	Glass front (Gorilla Glass 6), aluminum back, aluminum frame
	SIM	Nano-SIM and/or eSIM	Nano-SIM and/or eSIM	Nano-SIM and/or eSIM
DISPLAY	Type	OLED, HDR	OLED, HDR	OLED, 90Hz, HDR10+
	Size	5.81 inches, 83.2 cm ² (~83.3% screen-to-body ratio)	6.2 inches, 95.7 cm ² (~84.1% screen-to-body ratio)	6.0 inches, 87.6 cm ² (~85.9% screen-to-body ratio)
	Resolution	1080 x 2340 pixels, 19.5:9 ratio (~443 ppi density)	1080 x 2340 pixels, 19.5:9 ratio (~413 ppi density)	1080 x 2340 pixels, 19.5:9 ratio (~432 ppi density)
	Protection	Corning Gorilla Glass 3 Always-on display	Corning Gorilla Glass 3 Always-on display	Corning Gorilla Glass 6 Always-on display
PLATFORM	OS	Android 10, upgradable to Android 11	Android 11	Android 11
	Chipset	Qualcomm SDM730 Snapdragon 730G (8 nm)	Qualcomm SM7250 Snapdragon 765G (7 nm)	Qualcomm SM7250 Snapdragon 765G (7 nm)
	CPU	Octa-core (2x2.2 GHz Kryo 470 Gold & 6x1.8 GHz Kryo 470 Silver)	Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)	Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)
	GPU	Adreno 618	Adreno 620	Adreno 620

Attachment 4 (Processor of Google Pixel 4a, Pixel 4a 5G, and Pixel 5) at 1.

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="370 254 1518 289">Using Turn-by-Turn Navigation with the Galaxy S20 Google Maps</p> <p data-bbox="370 312 643 336">Time Needed : 8 minutes</p> <p data-bbox="370 367 1518 420">The following steps demonstrate the actual process of setting up and utilizing turn-by-turn navigation system with the Google Maps app on the new Samsung Galaxy S20 handset.</p> <p data-bbox="370 422 1518 474">Before you begin, verify and ensure that location is enabled on your phone. It has to be enabled so that your device can determine your current location.</p> <p data-bbox="414 504 1258 556">1. Tap to open the Google folder from the Home screen. A new screen consisting of Google-related apps and services will be displayed.</p> <div data-bbox="436 579 837 1293">  <p>The screenshot shows a home screen with a purple floral wallpaper. At the top, there's a weather widget with a plus icon and the text 'Tap for weather info'. Below that is a Google search bar. In the dock, there are icons for Galaxy Store, Gallery, Play Store, and Google. A yellow arrow points to the Google icon in the dock.</p> </div> <p data-bbox="906 682 1412 800">Google Maps preloaded in the Wireless mobile communication devices (Exhibit B), such as Galaxy S20. Current location of the device is determined if location is enabled</p> <p data-bbox="358 1325 1068 1356">Attachment 5 (how to use turn by turn Google map) at 1.</p>

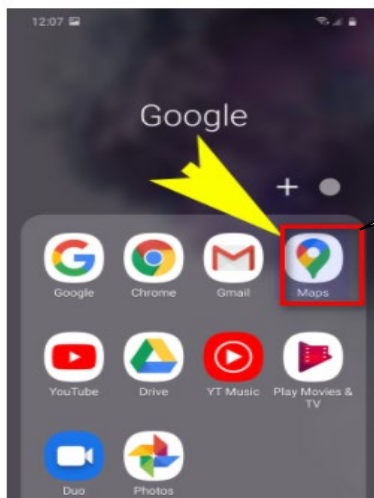
Claim 1

Corresponding Structure in Accused Systems



2. Tap Maps to open Google Maps app.

If this is the first time you use Google Maps on your Galaxy S20, you'll be prompted with a Welcome screen. If you see this screen, read and review the information then tap **GOT IT** to proceed.



Google Maps preloaded in the Wireless mobile communication devices (Exhibit B), such as Galaxy S20.

Attachment 5 (how to use turn by turn google map) at 2&3.



Personal Business

Shop Why Verizon Support

Home > Support > Sony > Sony Xperia Z2 > Google Maps - Find Current Location

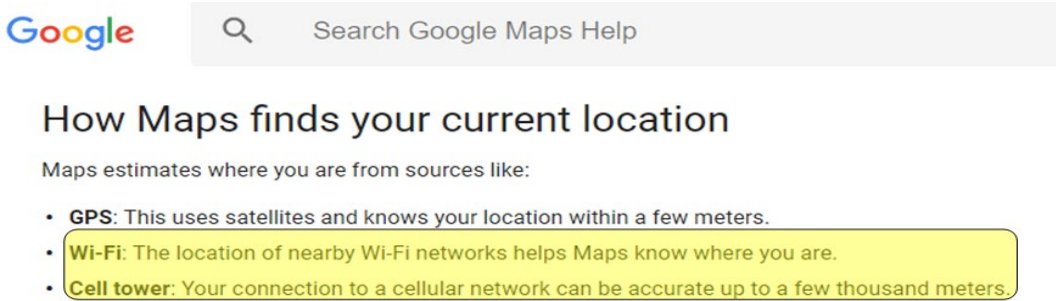
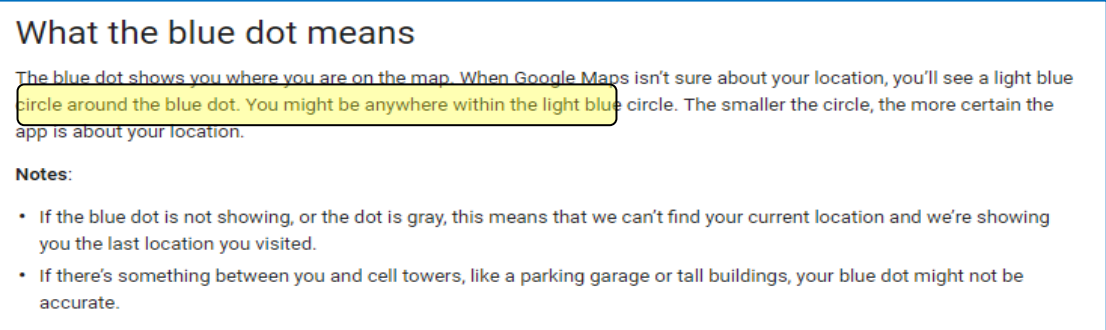
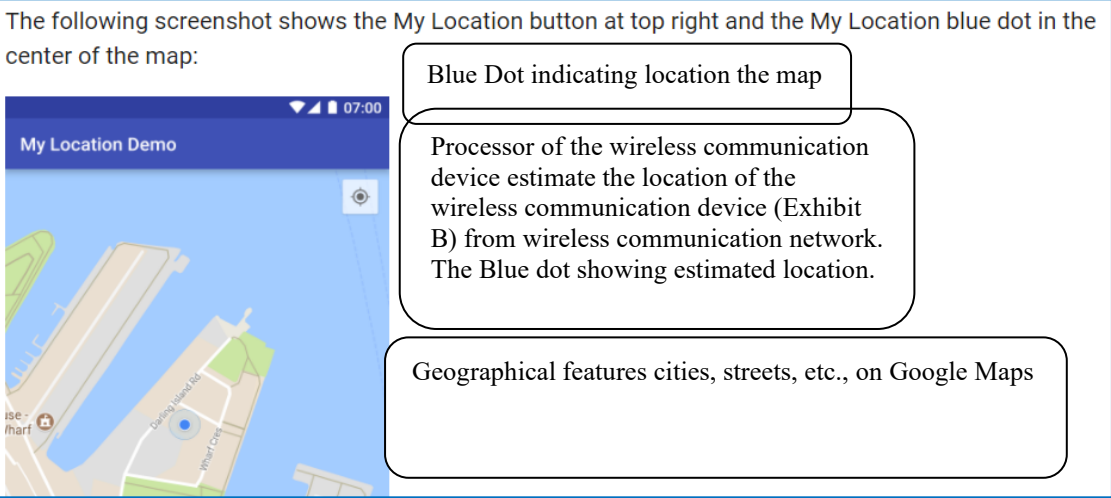
Google Maps™ - Find Current Location

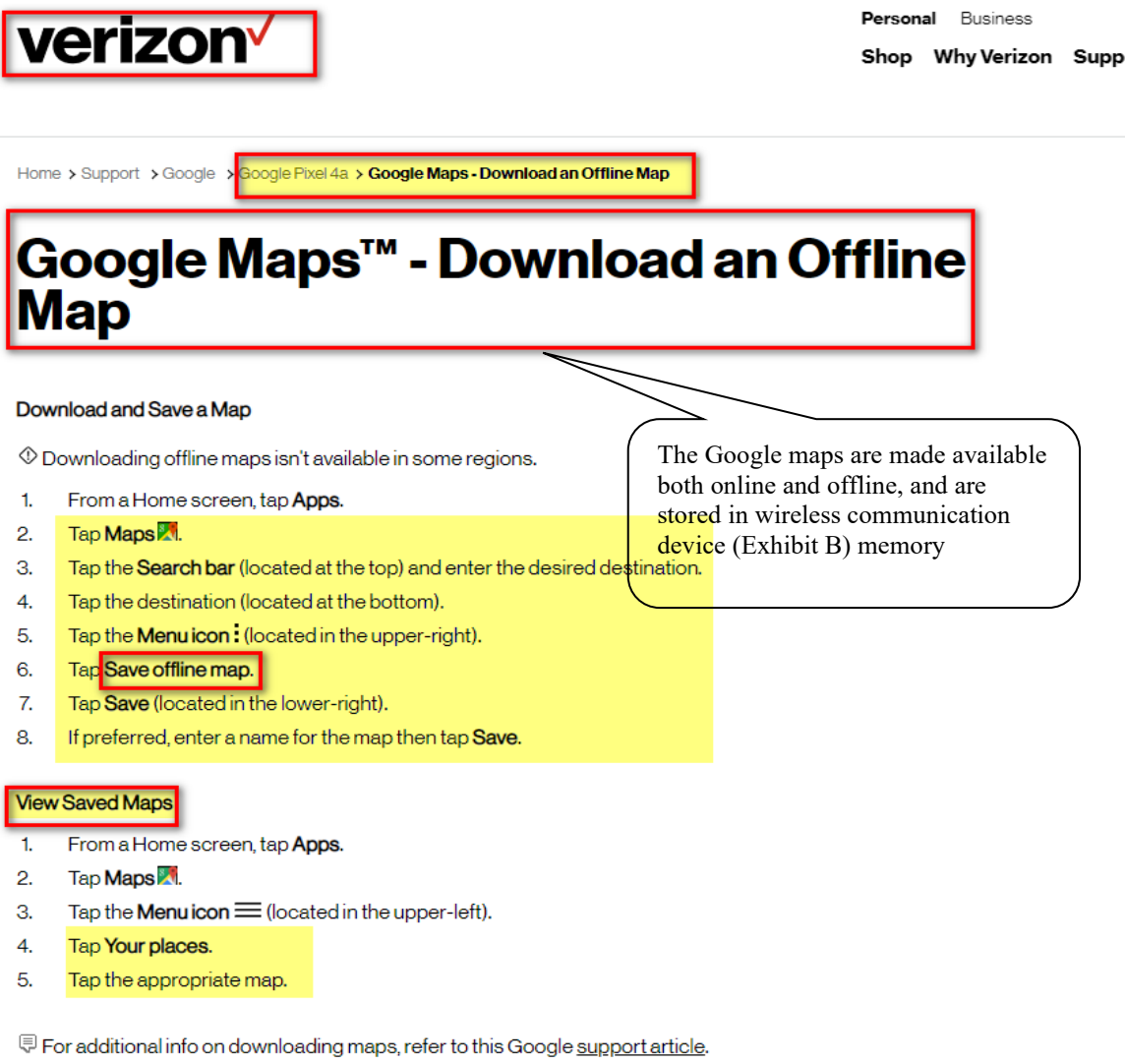
Notes:

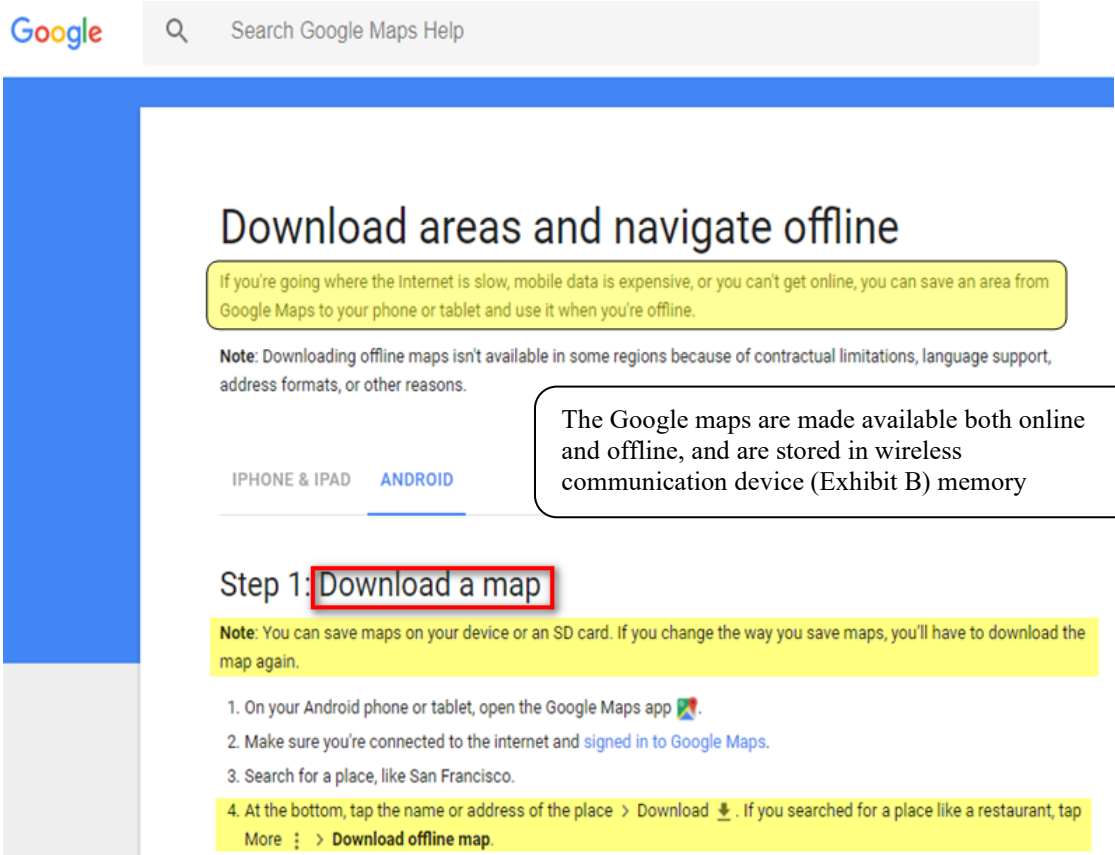
- If the Google Maps app isn't already installed on your device, it can be [downloaded](#) from the Google Play Store™.
- For further assistance, refer to the Google Maps [Help Center](#).













- From a Home screen, tap **Apps**.
- Tap **Maps**.
- Tap the **My Location** icon (located in the lower-right).

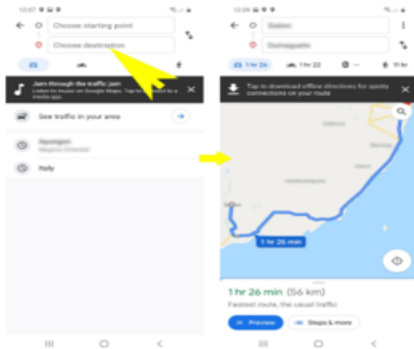
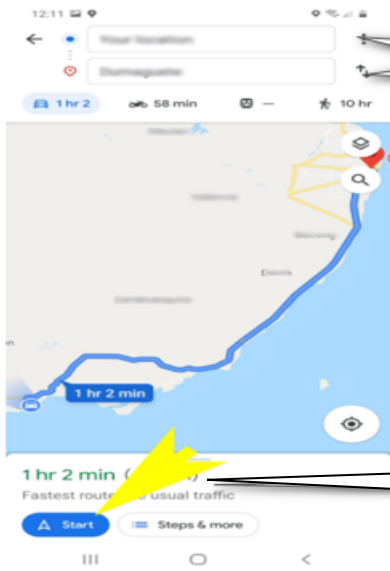
Wireless communication networks (e.g. Verizon, AT&T, T-Mobile, etc.) estimate/determine the location of the Wireless communication device (Exhibit B) on Google Maps.

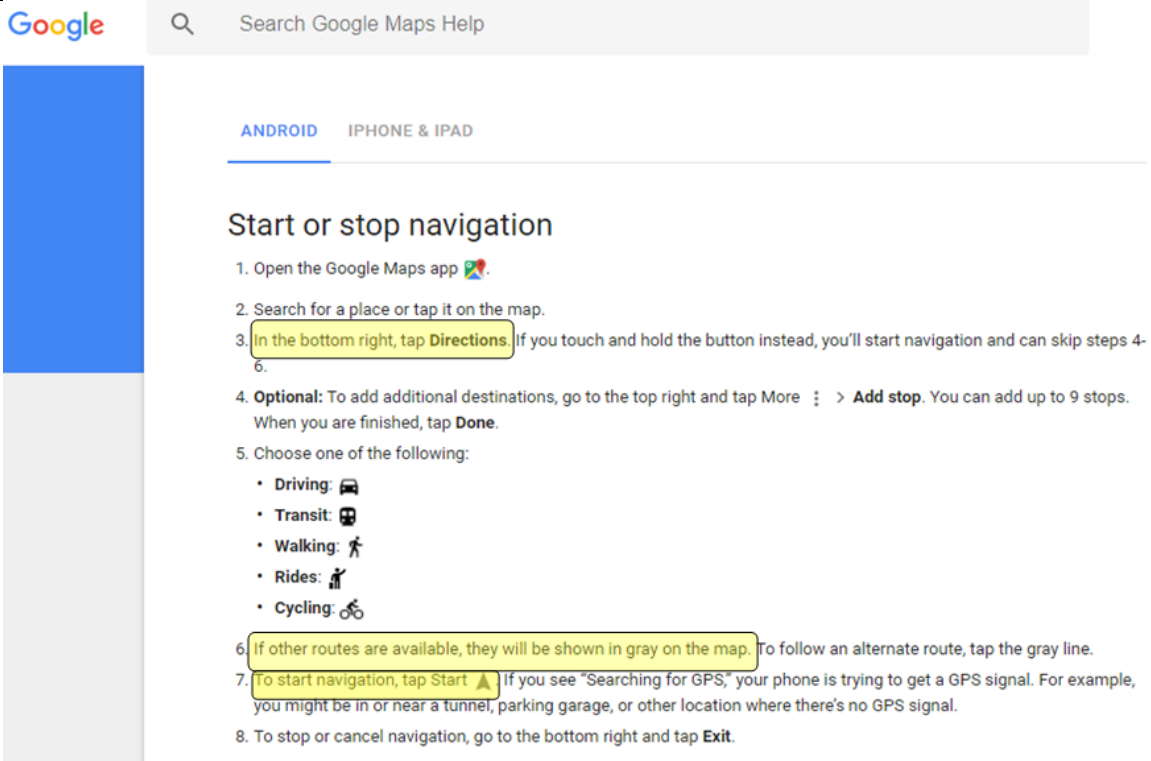
Claim 1	Corresponding Structure in Accused Systems
	<p>Attachment 6 (Find Current Location on Google map) at 1.</p>  <p>Attachment 8 (How map finds your current location) at 2.</p>  <p>Attachment 8 (Current location shown on google map) at 3.</p>  <p>Source: Location estimation on the Wireless communication device</p> <p>Attachment 22 (Location estimation on the Wireless communication device) at 10.</p>

Claim 1	Corresponding Structure in Accused Systems
	 <p>Google Maps™ - Download an Offline Map</p> <p>Download and Save a Map</p> <p>◇ Downloading offline maps isn't available in some regions.</p> <ol style="list-style-type: none"> 1. From a Home screen, tap Apps. 2. Tap Maps. 3. Tap the Search bar (located at the top) and enter the desired destination. 4. Tap the destination (located at the bottom). 5. Tap the Menu icon (located in the upper-right). 6. Tap Save offline map. 7. Tap Save (located in the lower-right). 8. If preferred, enter a name for the map then tap Save. <p>View Saved Maps</p> <ol style="list-style-type: none"> 1. From a Home screen, tap Apps. 2. Tap Maps. 3. Tap the Menu icon (located in the upper-left). 4. Tap Your places. 5. Tap the appropriate map. <p>For additional info on downloading maps, refer to this Google support article.</p> <p>Attachment 10 (Google Map-Download an offline map on Pixel 4a) at 1.</p>

Claim 1	Corresponding Structure in Accused Systems
	 <p>Download areas and navigate offline</p> <p>If you're going where the Internet is slow, mobile data is expensive, or you can't get online, you can save an area from Google Maps to your phone or tablet and use it when you're offline.</p> <p>Note: Downloading offline maps isn't available in some regions because of contractual limitations, language support, address formats, or other reasons.</p> <p>IPHONE & IPAD ANDROID</p> <p>Step 1: Download a map</p> <p>Note: You can save maps on your device or an SD card. If you change the way you save maps, you'll have to download the map again.</p> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app. 2. Make sure you're connected to the internet and signed in to Google Maps. 3. Search for a place, like San Francisco. 4. At the bottom, tap the name or address of the place > Download . If you searched for a place like a restaurant, tap More > Download offline map. <p>The Google maps are made available both online and offline, and are stored in wireless communication device (Exhibit B) memory</p> <p>Attachment 9 (Mapping information stored on wireless communication device) at 1.</p>




Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="375 224 1019 268">Get directions & show routes</p> <p data-bbox="375 281 1406 331">You can get directions for driving, public transit, walking, or biking on Google Maps. Whenever you find multiple routes, the best route to your destination is blue. Other routes are in gray on the map.</p> <p data-bbox="375 350 1419 449">Some directions in Google Maps are in beta, and may have limited availability. Always be cautious when using directions on Google Maps, remain aware of your surroundings at all times, and take necessary means to ensure safety of yourself and those around you. When in doubt, follow actual traffic regulations by confirming signage from the road or path that you are on when using directions.</p> <p data-bbox="396 510 789 533"> Android Computer iPhone & iPad </p> <hr/> <ol data-bbox="383 600 1000 919" style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. Search for your destination or tap it on the map. 3. In the bottom left, tap Directions . 4. Choose one of the following: <ul style="list-style-type: none"> • Driving:  • Motorcycle:  • Transit:  • Walking:  • Rides:  • Cycling:  <p data-bbox="383 936 1240 957">5. To get the list of directions, tap the bar at the bottom that shows travel time and distance.</p> <p data-bbox="383 968 1338 989">6. To choose another route, tap it on the map. Each route shows the estimated travel time on the map.</p> <p data-bbox="375 1010 412 1031">Tip:</p> <ul data-bbox="383 1052 1419 1161" style="list-style-type: none"> • For transit directions, choose a route, then tap the bar at the bottom that shows travel time and distance. • Not all cities have public transit directions in Google Maps. Learn which cities are covered . • For Driving  and Transit  directions, to pin your favorite trips, tap Pin  at the bottom. Learn more about how to pin your favorite trips. <p data-bbox="358 1199 997 1230">Attachment 32 (Get directions & show routes) at 3.</p>












Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="370 237 1404 317">4. Tap the Choose destination field to specify your target location as a travel destination. On the next screen, simply type in the name of the place where you'd like to travel to. If prompted, select the correct location from the search result.</p> <div data-bbox="394 342 805 688">  </div> <div data-bbox="862 352 1398 485"> <p>Navigation Information displayed to user based on destination entered on the Wireless communication device (Exhibit B).</p> </div> <p data-bbox="370 705 1404 756">5. After entering your destination, tap the Start button at the bottom-left corner of the screen. That should prompt the app to start giving turn by turn navigation instructions.</p> <div data-bbox="394 772 781 1339">  </div> <div data-bbox="862 758 1268 867"> <p>Current location and destination location on the map</p> </div> <div data-bbox="894 982 1292 1108"> <p>Geographical features cities, streets, or other point of interests, etc.</p> </div> <div data-bbox="922 1171 1247 1283"> <p>Estimate time to reach the destination</p> </div> <p data-bbox="358 1360 1382 1396">Attachment 5 (Navigation based on destination entered on Google Maps) at 4 & 5.</p>








Claim 1	Corresponding Structure in Accused Systems
	 <p>The screenshot shows the Google Maps app interface for starting or stopping navigation. It includes a search bar at the top, tabs for 'ANDROID' and 'IPHONE & IPAD', and a list of steps numbered 1 through 8. Step 3 is highlighted with a yellow box: 'In the bottom right, tap Directions.' Step 6 is highlighted with a yellow box: 'If other routes are available, they will be shown in gray on the map.' Step 7 is highlighted with a yellow box: 'To start navigation, tap Start'.</p> <p>Attachment 11 (Navigation based on destination entered on Google Maps) at 1 & 2.</p> <p>Use offline maps</p> <p>After you download an area, use the Google Maps app just like you normally would.</p> <ul style="list-style-type: none"> • Get directions and see routes • Use navigation • Search for locations <p>If your Internet connection is slow or absent, Google Maps will use your offline maps to give you directions.</p> <p>Notes:</p> <ul style="list-style-type: none"> • You can get driving directions offline, but not transit, bicycling, or walking directions. In your driving directions, you won't have traffic info, alternate routes, or lane guidance. • To save cell data and battery life, use "Wi-Fi only" mode. In this mode, when you're not connected to Wi-Fi, Google Maps will only use data from the offline maps that you've downloaded. Before you use this mode, make sure you download offline maps. To turn on this mode, tap your profile picture or initial > Settings > turn on Wi-Fi only. <p>Manage offline maps</p> <p>See a list of your offline maps</p> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. Tap your profile picture or initial > Offline maps. <p>You can select your own map to download, or view maps you've already downloaded.</p> <p>Attachment 31 (Download google map) at 2.</p>

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="378 247 938 1339"></div> <div data-bbox="1036 275 1482 468"><p>Navigation Information displayed to user by the processor on the wireless communication device (Exhibit-B) based on destination entered by the user.</p></div> <div data-bbox="1003 485 1507 688"><p>Navigation Information displayed to user based on destination entered on the Wireless communication device (Exhibit B).</p></div> <div data-bbox="1036 730 1482 852"><p>Geographical features cities, streets, or other point of interests, etc.</p></div> <p data-bbox="358 1367 1256 1396">Attachment 25 (Use Google Maps - Samsung Galaxy S20 Ultra 5G) at 6.</p>

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="534 233 1143 1247"> </div> <div data-bbox="1016 260 1461 378"> <p>Navigation Information displayed to user based on destination entered on the Wireless communication device (Exhibit B).</p> </div> <div data-bbox="1182 768 1481 798"> <p>Current location on the map</p> </div> <div data-bbox="1138 1003 1442 1092"> <p>Geographical features cities, streets, or other point of interests, etc.</p> </div> <p>Source: Navigation based on destination entered on Google Maps</p>
<p>wherein the first processor further sends the user navigation information to the network as a number of segments, wherein at least one other processor outside the network updates the user navigation information in conformity with traffic congestion</p>	<p>Plaintiff contends each item listed on Exhibit B corresponds to this claim limitation because each Exhibit-B item includes a processor. Wireless mobile communication device- including but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list) has a processor, for example, Quad-Core/ Octa-core processor.</p> <p>Further, the Google Maps utilizing the processor can send the user navigation information to the network as a number of segments as to receive the traffic information for the segments, it is required to send the navigation information to the network as a number of segments.</p> <p>As can be seen from the citations, the wireless communications device (Exhibit-B), having a processor, while navigating keeps on communicating the navigation information to the wireless communication network. The Google Maps hardware/software in the wireless communication network computes the average speed (numerical value) or average delays for each segment based on traffic congestion information for each segment. The updated information in response to the user's current navigation information is then transmitted by Google Maps hardware/software to</p>

Claim 1	Corresponding Structure in Accused Systems																																																													
information accessible to the at least one other processor outside the network by computing a numerical value for the segments corresponding to the expected time to travel through the segments, updates the user navigation information in conformity with the numerical values for the segments, and sends the updated user navigation information to the wireless mobile communications device;	<p>the wireless communication device (Exhibit-B). The Google Map provides the user of the wireless communication device with the delays from traffic, summary of incidents and the average speed of each segment on the traffic page and also provides the user with the suggested navigation information with the received traffic information. The suggested route screen shows the proposed new route, outlining the original and suggested route, as well as listing the estimated time saved.</p> <p>The following exemplifies the existence of this limitation in Accused Systems:</p> <div><div><div><div><div>Google Pixel 4a</div><div><div>REVIEW SPECIFICATIONS READ OPINIONS PICTURES</div></div><div><div>FULL OR DIFFERENCES</div><div>Change compare mode</div></div><div>128GB 6GB RAM</div><div>ALL PRICES</div></div><div><div><div>Google Pixel 4a 5G</div><div><div>PREVIEW SPECIFICATIONS READ OPINIONS PICTURES</div></div><div><div>FULL OR DIFFERENCES</div><div>Change compare mode</div></div><div>128GB 6GB RAM</div><div>ALL PRICES</div></div><div><div><div>Google Pixel 5</div><div><div>REVIEW SPECIFICATIONS READ OPINIONS PICTURES</div></div><div><div>FULL OR DIFFERENCES</div><div>Change compare mode</div></div><div>128GB 8GB RAM</div><div>ALL PRICES</div></div></div><div><p>Preloaded application Google Map on the Wireless mobile device utilizes the processor coupled to the transceiver to estimates/receive the location on mobile wireless communications device by utilizing wireless communication network</p></div><table><tr><th>NETWORK</th><th>Technology</th><th>GSM / HSPA / LTE</th><th>GSM / HSPA / LTE / 5G</th><th>GSM / CDMA / HSPA / EVDO / LTE / 5G</th></tr><tr><td>LAUNCH</td><td>Announced Status</td><td>2020, August 03 Available. Released 2020, August 20</td><td>2020, September 30 Available. Released 2020, November 05</td><td>2020, September 30 Available. Released 2020, October 15</td></tr><tr><td rowspan="4">BODY</td><td>Dimensions</td><td>144 x 69.4 x 8.2 mm (5.67 x 2.73 x 0.32 in)</td><td>153.9 x 74 x 8.2 mm (Sub-6) or 8.5 mm (Sub-6 and mmWave)</td><td>144.7 x 70.4 x 8 mm (5.70 x 2.77 x 0.31 in)</td></tr><tr><td>Weight</td><td>143 g (5.04 oz)</td><td>168 g (5G Sub-6); 171 g (5G Sub-6 and mmWave) (5.93 oz)</td><td>151 g (5.33 oz)</td></tr><tr><td>Build</td><td>Glass front (Gorilla Glass 3), plastic back, plastic frame</td><td>Glass front (Gorilla Glass 3), plastic back, plastic frame</td><td>Glass front (Gorilla Glass 6), aluminum back, aluminum frame</td></tr><tr><td>SIM</td><td>Nano-SIM and/or eSIM</td><td>Nano-SIM and/or eSIM</td><td>Nano-SIM and/or eSIM</td></tr><tr><td rowspan="3">DISPLAY</td><td>Type</td><td>OLED, HDR</td><td>OLED, HDR</td><td>OLED, 90Hz, HDR10+</td></tr><tr><td>Size</td><td>5.81 inches, 83.2 cm² (~83.3% screen-to-body ratio)</td><td>6.2 inches, 95.7 cm² (~84.1% screen-to-body ratio)</td><td>6.0 inches, 87.6 cm² (~85.9% screen-to-body ratio)</td></tr><tr><td>Resolution</td><td>1080 x 2340 pixels, 19.5:9 ratio (~443 ppi density)</td><td>1080 x 2340 pixels, 19.5:9 ratio (~413 ppi density)</td><td>1080 x 2340 pixels, 19.5:9 ratio (~432 ppi density)</td></tr><tr><td rowspan="4">PLATFORM</td><td>Protection</td><td>Corning Gorilla Glass 3 Always-on display</td><td>Corning Gorilla Glass 3 Always-on display</td><td>Corning Gorilla Glass 6 Always-on display</td></tr><tr><td>OS</td><td>Android 10, upgradable to Android 11</td><td>Android 11</td><td>Android 11</td></tr><tr><td>Chipset</td><td>Qualcomm SDM730 Snapdragon 730G (8 nm)</td><td>Qualcomm SM7250 Snapdragon 765G (7 nm)</td><td>Qualcomm SM7250 Snapdragon 765G (7 nm)</td></tr><tr><td>CPU</td><td>Octa-core (2x2.2 GHz Kryo 470 Gold & 6x1.8 GHz Kryo 470 Silver)</td><td>Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)</td><td>Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)</td></tr><tr><td>GPU</td><td>Adreno 618</td><td>Adreno 620</td><td>Adreno 620</td></tr></table><p>Attachment 4 (Processor of Google Pixel 4a, Pixel 4a 5G and Pixel 5) at 1.</p></div></div></div></div>	NETWORK	Technology	GSM / HSPA / LTE	GSM / HSPA / LTE / 5G	GSM / CDMA / HSPA / EVDO / LTE / 5G	LAUNCH	Announced Status	2020, August 03 Available. Released 2020, August 20	2020, September 30 Available. Released 2020, November 05	2020, September 30 Available. Released 2020, October 15	BODY	Dimensions	144 x 69.4 x 8.2 mm (5.67 x 2.73 x 0.32 in)	153.9 x 74 x 8.2 mm (Sub-6) or 8.5 mm (Sub-6 and mmWave)	144.7 x 70.4 x 8 mm (5.70 x 2.77 x 0.31 in)	Weight	143 g (5.04 oz)	168 g (5G Sub-6); 171 g (5G Sub-6 and mmWave) (5.93 oz)	151 g (5.33 oz)	Build	Glass front (Gorilla Glass 3), plastic back, plastic frame	Glass front (Gorilla Glass 3), plastic back, plastic frame	Glass front (Gorilla Glass 6), aluminum back, aluminum frame	SIM	Nano-SIM and/or eSIM	Nano-SIM and/or eSIM	Nano-SIM and/or eSIM	DISPLAY	Type	OLED, HDR	OLED, HDR	OLED, 90Hz, HDR10+	Size	5.81 inches, 83.2 cm ² (~83.3% screen-to-body ratio)	6.2 inches, 95.7 cm ² (~84.1% screen-to-body ratio)	6.0 inches, 87.6 cm ² (~85.9% screen-to-body ratio)	Resolution	1080 x 2340 pixels, 19.5:9 ratio (~443 ppi density)	1080 x 2340 pixels, 19.5:9 ratio (~413 ppi density)	1080 x 2340 pixels, 19.5:9 ratio (~432 ppi density)	PLATFORM	Protection	Corning Gorilla Glass 3 Always-on display	Corning Gorilla Glass 3 Always-on display	Corning Gorilla Glass 6 Always-on display	OS	Android 10, upgradable to Android 11	Android 11	Android 11	Chipset	Qualcomm SDM730 Snapdragon 730G (8 nm)	Qualcomm SM7250 Snapdragon 765G (7 nm)	Qualcomm SM7250 Snapdragon 765G (7 nm)	CPU	Octa-core (2x2.2 GHz Kryo 470 Gold & 6x1.8 GHz Kryo 470 Silver)	Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)	Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)	GPU	Adreno 618	Adreno 620	Adreno 620
NETWORK	Technology	GSM / HSPA / LTE	GSM / HSPA / LTE / 5G	GSM / CDMA / HSPA / EVDO / LTE / 5G																																																										
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GPU	Adreno 618	Adreno 620	Adreno 620																																																											

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="371 237 1013 285"> <h2>Get directions & show routes</h2> </div> <div data-bbox="371 296 1398 346"> <p>You can get directions for driving, public transit, walking, or biking on Google Maps. Whenever you find multiple routes, the best route to your destination is blue. Other routes are in gray on the map.</p> </div> <div data-bbox="371 363 1408 464"> <p>Some directions in Google Maps are in beta, and may have limited availability. Always be cautious when using directions on Google Maps, remain aware of your surroundings at all times, and take necessary means to ensure safety of yourself and those around you. When in doubt, follow actual traffic regulations by confirming signage from the road or path that you are on when using directions.</p> </div> <div data-bbox="389 525 786 546"> <p>Android Computer iPhone & iPad</p> </div> <div data-bbox="376 611 878 930"> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google M 2. Search for your destination or tap it on the map. 3. In the bottom left, tap Directions . 4. Choose one of the following: <ul style="list-style-type: none"> • Driving:  • Motorcycle:  • Transit:  • Walking:  • Rides:  • Cycling:  </div> <div data-bbox="906 558 1386 768"> <p>The process of inputting a destination entry and initiating a navigation query at the Google Maps' client-side user interface (UI) at a user's communications device, and in response receiving navigation assistance (directions) from the remote Google Maps server.</p> </div> <div data-bbox="376 945 1325 1001"> <ol style="list-style-type: none"> 5. To get the list of directions, tap the bar at the bottom that shows travel time and distance. 6. To choose another route, tap it on the map. Each route shows the estimated travel time on the map. </div> <div data-bbox="371 1018 415 1041"> <p>Tip:</p> </div> <div data-bbox="371 1060 1408 1171"> <ul style="list-style-type: none"> • For transit directions, choose a route, then tap the bar at the bottom that shows travel time and distance. • Not all cities have public transit directions in Google Maps. Learn which cities are covered . • For Driving  and Transit  directions, to pin your favorite trips, tap Pin  at the bottom. Learn more about how to pin your favorite trips. </div> <div data-bbox="354 1207 1408 1241"> <p>Attachment 32 (Get directions and show routes - Android - Google Maps Help) at 1.</p> </div>

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="412 233 594 264">Save a route</div> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. Make sure you're connected to the Internet. 3. Search for your destination or tap it on the map. 4. In the bottom left, tap Directions . 5. From the top, choose your mode of transit. 6. Tap the white bar at the bottom. It's the one that shows the travel time and distance. 7. At the bottom, tap Save offline. <p>Tip:</p> <ul style="list-style-type: none"> • Your route is saved on your phone or tablet. Make sure to use the same phone or tablet when looking for a saved route. • Your saved route expires after 30 days. • Your route will show you the same mode of transit you chose when you saved the route. <div data-bbox="412 730 659 762">Find a saved route</div> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. At the bottom, tap Saved offline route. <p>Tip:</p> <ul style="list-style-type: none"> • If you save a route from "Your location" and look up a saved route, the directions will start from the place where you saved the route. The directions won't start from your current location. • To get updated information like traffic, tap Refresh . • Turn-by-turn navigation isn't currently available for saved routes. To search for places and get turn-by-turn navigation, download an offline area. <p>Attachment 32 (Get directions & show routes) at 3.</p> <div data-bbox="380 1136 626 1167">Update offline maps </div> <p>Offline maps that you downloaded on your phone or tablet need to be updated before they expire. When your offline maps expire in 15 days or less, Google Maps will try to update the area automatically when you're connected to Wi-Fi.</p> <p>If your offline maps aren't automatically updated, you can update them by following the steps below.</p> <p>From the notification</p> <ol style="list-style-type: none"> 1. In the "Update offline maps" notification, tap Update Now. 2. Tap the expired or expiring area on the list. 3. Tap Update. 4. The offline area will update <p>From anywhere else</p> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. Tap your profile picture or initial  > Offline maps. 3. Tap the expired or expiring area on the list. 4. Tap Update. 5. The offline area will update <p>Attachment 31 (Download google map) at 3.</p>

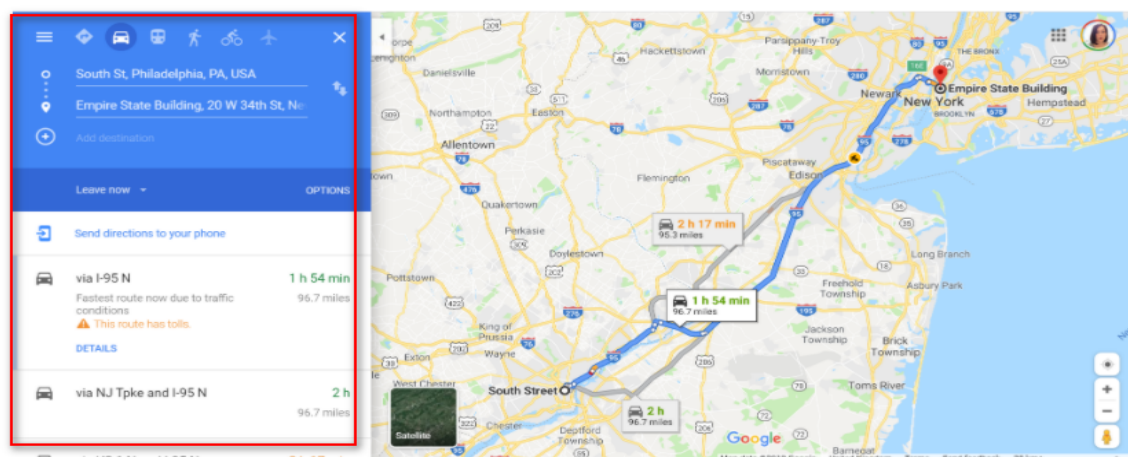
Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="396 323 977 359"> <h2>Get traffic or search for places along the way</h2> </div> <div data-bbox="396 369 855 386"> <p>Important: This feature is only available on Android devices and in some countries.</p> </div> <div data-bbox="396 396 1003 432"> <p>With Google Maps, you can get traffic for your drive, search for places easily, or quickly navigate to a common type of place, even if you don't enter a destination in Maps.</p> </div> <div data-bbox="396 464 633 489"> <h3>Get traffic for your drive</h3> </div> <div data-bbox="396 499 555 516"> <p>To view traffic for your drive:</p> </div> <div data-bbox="396 527 781 592"> <ol style="list-style-type: none"> 1. On your mobile device, open the Google Maps app. 2. At the bottom, tap Go. 3. Select one of the trip options that show up from your past activity. </div> <div data-bbox="396 602 833 619"> <p>Tip: If the selected trip doesn't show up, scroll to find and pin the trip you want.</p> </div> <div data-bbox="396 630 545 648"> <p>You'll find information like:</p> </div> <div data-bbox="396 659 995 739"> <ul style="list-style-type: none"> • How long it takes to drive to a suggested destination. Destinations are shown based on data from Google Account settings. • Recommended and alternate routes. • Traffic delays along the way, such as crashes or construction work. </div> <div data-bbox="396 749 557 766"> <p>Learn how to use the Go tab.</p> </div> <div data-bbox="396 793 609 816"> <h3>Create a driving shortcut</h3> </div> <div data-bbox="396 825 850 842"> <p>To easily get traffic for your drive, create a driving shortcut for your mobile screen.</p> </div> <div data-bbox="396 852 779 917"> <ol style="list-style-type: none"> 1. On your mobile device, open the Google Maps app. 2. Tap your profile picture or initial. 3. Choose Settings > Navigation settings > Add Driving shortcut. </div> <div data-bbox="396 940 727 963"> <h3>Get driving notifications with Bluetooth</h3> </div> <div data-bbox="396 972 1021 1008"> <p>If you have Bluetooth turned on and your phone or tablet is paired to your car, you'll get driving notifications when you start your car. To turn on notifications:</p> </div> <div data-bbox="396 1018 776 1083"> <ol style="list-style-type: none"> 1. On your mobile device, open the Google Maps app. 2. Tap your profile picture or initial. 3. Choose Settings > Navigation settings > Driving notifications. </div> <div data-bbox="396 1115 644 1140"> <h3>Find events on your route</h3> </div> <div data-bbox="396 1150 854 1167"> <p>When you check the traffic on your route, you may find events highlighted, such as:</p> </div> <div data-bbox="396 1178 500 1262"> <ul style="list-style-type: none"> • Concerts • Parades • Marathons • Sporting events </div> <div data-bbox="396 1272 677 1291"> <p>On event days, you'll get updates about things like:</p> </div> <div data-bbox="396 1302 508 1386"> <ul style="list-style-type: none"> • Delays • Closures • Traffic conditions • Alternate routes </div> <div data-bbox="396 1396 974 1415"> <p>This info will go away automatically once the event is over. Explore other activities you can find in Maps.</p> </div> <div data-bbox="1127 388 1159 405"> <p>Help</p> </div> <div data-bbox="1127 430 1386 1054"> <ul style="list-style-type: none"> Get directions & show routes Use navigation in the Google Maps app Check your speed Request a ride Add a shortcut to places you visit often Get traffic or search for places along the way Use Google Assistant while navigating Get train & bus departures Get directions without unlocking your phone Set a reminder to leave for your trip Plan your commute or trip Use Live View on Google Maps Know when you're taken off suggested route Use CarPlay to find stops on your route Use Google Maps on your Apple Watch How to use the Go tab </div>

Attachment 26 (Get traffic or search for places along the way - Google Maps Help) at 1.

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="381 247 630 277">Putting it all together</p> <p data-bbox="381 315 1398 676">So how exactly does this all work in real life? Say you're heading to a doctor's appointment across town, driving down the road you typically take to get there. When you leave the house, traffic is flowing freely, with zero indication of any disruptions along the way. With Google Maps' traffic predictions combined with live traffic conditions, we let you know that if you continue down your current route, there's a good chance you'll get stuck in unexpected gridlock traffic about 30 minutes into your ride—which would mean missing your appointment. As a result, Google Maps automatically reroutes you using its knowledge about nearby road conditions and incidents—helping you avoid the jam altogether and get to your appointment on time.</p> <p data-bbox="381 714 1390 825">Predicting traffic and determining routes is incredibly complex—and we'll keep working on tools and technology to keep you out of gridlock, and on a route that's as safe and efficient as possible. ■</p> <p data-bbox="358 863 1446 892">Attachment 35 (How AI helps predict traffic and determine routes - Google Maps) at 2.</p>

Claim 1**Corresponding Structure in Accused Systems****How to change your route on Google Maps on desktop**

1. Open Google Maps and type in the address or name of the location you wish to travel to before pressing Enter.
2. Once the location comes up, click the Directions button beneath the info card. 3. Enter the starting point for your journey. This could be your home address or wherever you'll be departing from.
4. Using the menu box above the journey information, choose which directions you would like to use - options for the purposes of this article include driving, public transit, cycling, and walking.
5. On the map, you'll notice outlines for several routes. The default one, or the one Google Maps believes is best, will be highlighted blue.



Jennifer Still/Business Insider

You can change your route by choosing one of the grey alternate ones, or dragging it to another route.

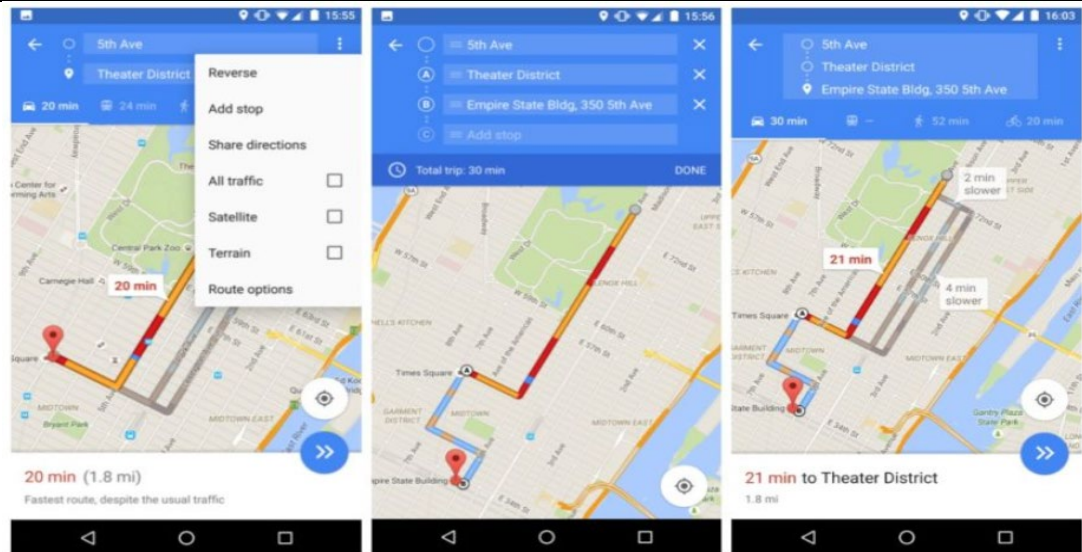
6. To choose an alternate route, either click on a greyed-out route on the map or click on one of the other routes listed on the left-hand side menu. Note that you can also change routes by clicking on one and dragging it so that the directions will take you via certain roads.

Attachment 37 (How to change the route on Google Map) at 3.


Google map Navigator hardware/software (Exhibit C) in the wireless network computes the estimated time delays (numerical value) for each segment corresponding to the time to travel through each segment. The updated information in response to user's current navigation information is then transmitted by the Google Map hardware/software (Exhibit C) to the wireless communication device (Exhibit-B)

Claim 1

Corresponding Structure in Accused Systems



Attachment 24 (Traffic information summary on Google Maps) at 9.



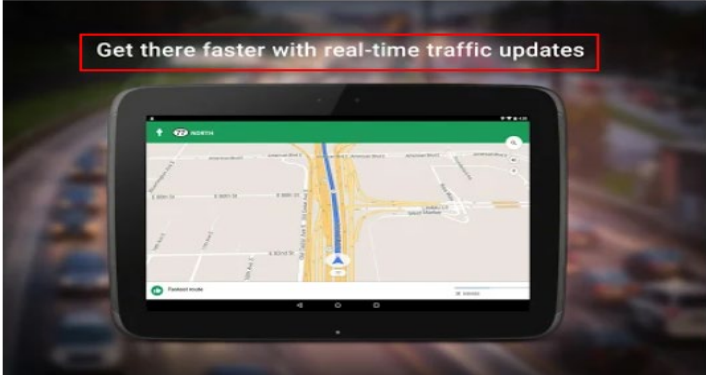
Google Maps - Navigate & Explore Editors' Choice

Google LLC Travel & Local ★★★★★ 1,27,56,420


Everyone

Contains ads

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Get there faster with real-time traffic updates








Catch your bus

Navigate your world faster and easier with Google Maps. Over 220 countries and territories mapped and hundreds of millions of businesses and places on the map. Get real-time GPS navigation, traffic, and transit info, and explore local neighborhoods by knowing where to eat, drink and go - no matter what part of the world you're in.

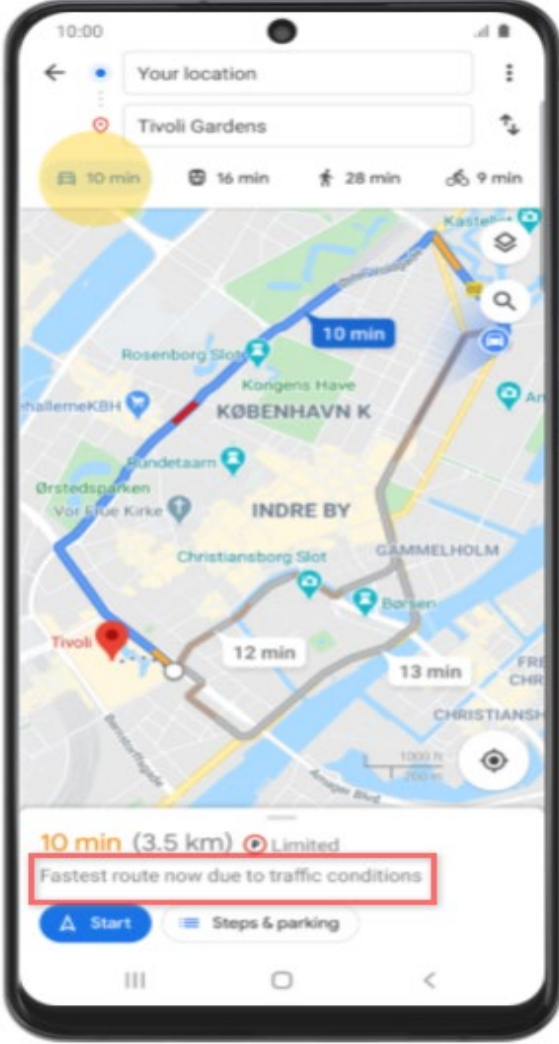
Get there faster with real-time updates

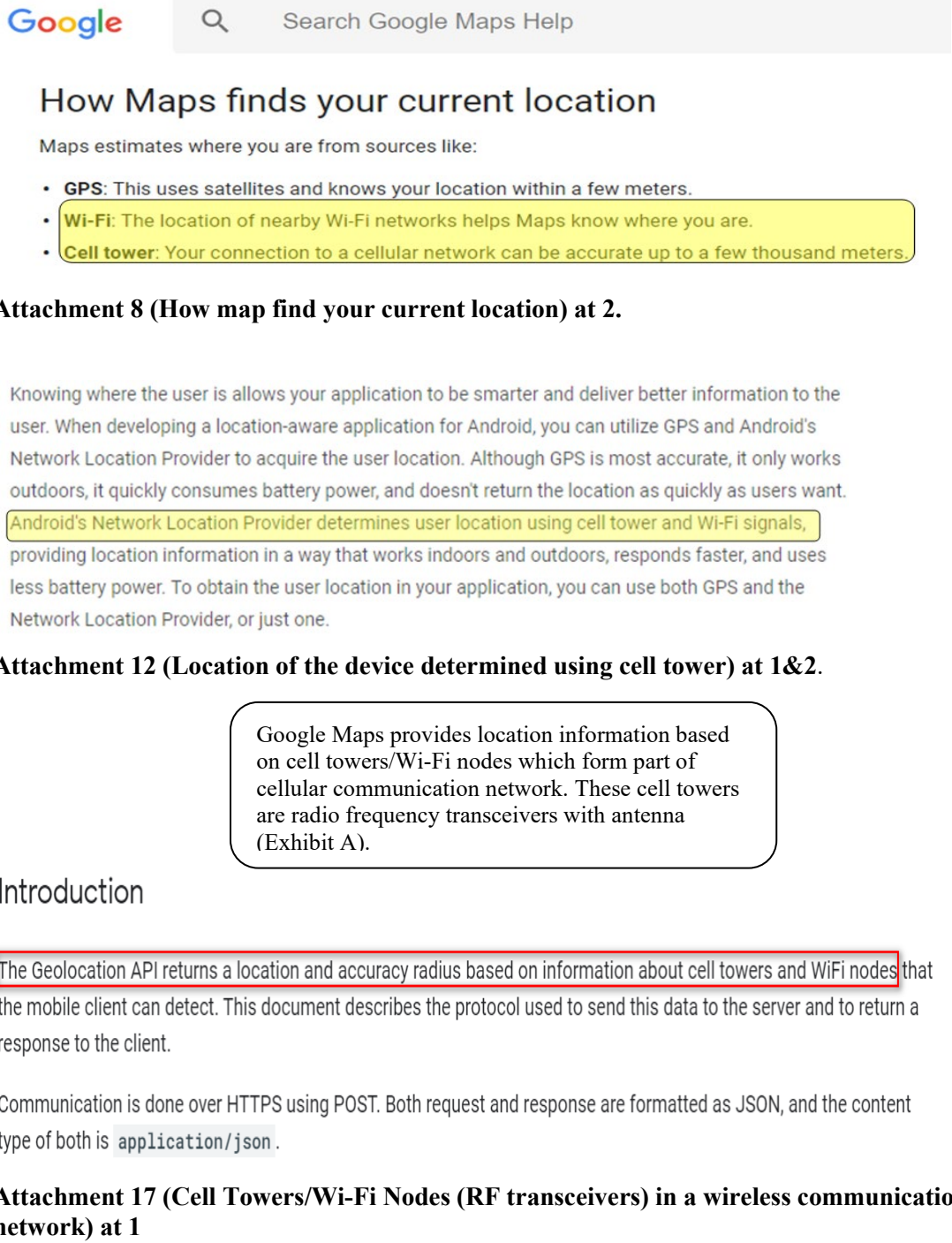
- Beat traffic with **real-time ETAs and traffic conditions**
- Catch your bus, train, or ride-share with real-time transit info
- Save time with automatic rerouting based on **live traffic**, incidents, and road closures

Attachment 23 (Google Maps – Navigation & Explore) at 1.

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="391 237 829 279" style="border: 1px solid red; padding: 2px;">Find live traffic for buses</div> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. Search for your destination, then select transit directions. Read more about how to get directions. 3. If a bus route has Live Traffic for Buses information available, one of the following will be displayed: <ul style="list-style-type: none"> • Usual traffic • How many minutes are added for traffic <p>What the colors and symbols mean on the legend</p> <hr/> <p>Nearby places of interest ▼</p> <hr/> <p>Traffic ^</p> <div> <p>Traffic colors</p> <p>The color code shows you the speed of traffic on the road.</p> <ul style="list-style-type: none"> • Green: No traffic delays. • Orange: Medium amount of traffic. • Red: Traffic delays. The darker the red, the slower the speed of traffic on the road. <p>Note: Gray or blue lines on the map show your routes.</p> <p>Traffic incident symbols</p> <p>Traffic incidents include these types of delays:</p> <ul style="list-style-type: none"> • Crashes  • Construction  • Road closures  • Other incidents  <p>To find details about what happened, click or tap the icon.</p> <p>Note: For road closures, you'll find a dotted red line where the road is closed.</p> </div> <p>Attachment 34 (View places, traffic, terrain, biking, and transit) at 2.</p>

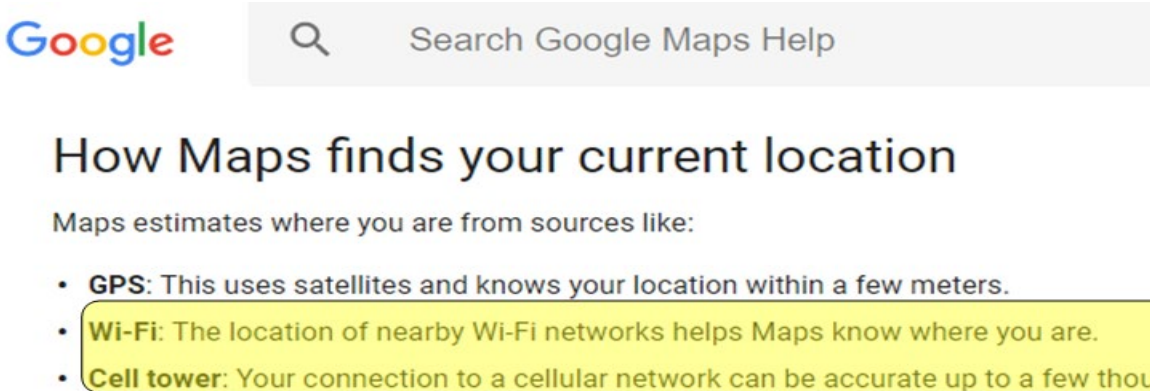
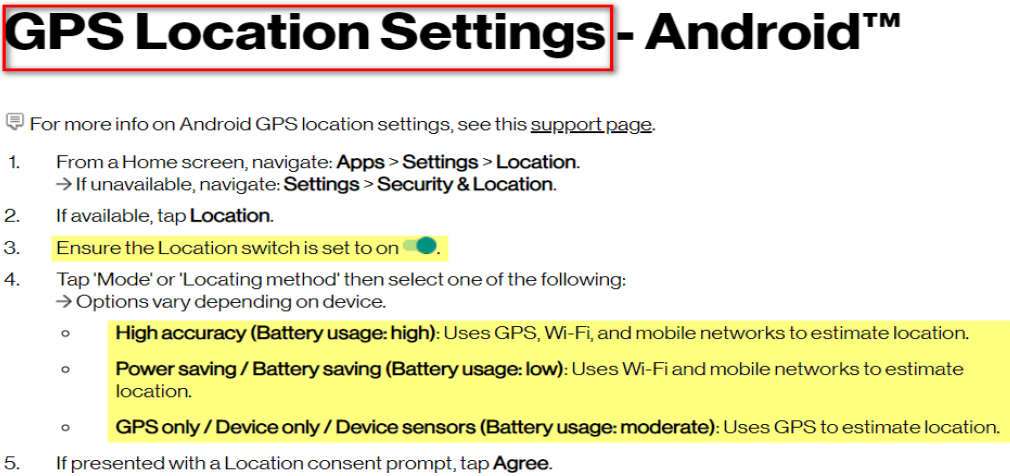
Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="370 237 1143 338"> <h3>Plan your commute or trip</h3> <p>Before you start your drive or transit trip to home, work or other places, plan your trip and find useful info. This way, you can know when to leave, what traffic to expect, which route to take, and if there are any disruptions along the way.</p> </div> <div data-bbox="370 373 1127 407"> <p>Android Computer iPhone & iPad</p> </div> <div data-bbox="370 436 1117 562"> <h3>Find traffic & transit info</h3> <p>You can use Google Maps to quickly find all of your frequent trips in one tap. You'll get information about your ETA, the traffic reports and the accidents along the way.</p> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. At the bottom, tap Go . <p>Tip: To show the map, tap anywhere on the map or drag the tabs back down.</p> </div> <div data-bbox="370 619 964 892"> <h3>Change the way you commute</h3> <p>You can get access to directions for your frequent trips by pinning trips on the Go tab .</p> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. At the bottom, tap Go . 3. Search for your destination in the search bar at the top. 4. At the bottom, tap on "Directions." 5. At the top, select your transportation mode. 6. Select your preferred route. 7. At the bottom, tap Pin . <p>You can pin your trip and find it back in the Go tab next time you need it.</p> <p>Tip: Pinning only works with "Driving" and "Transit." Learn more about the Go tab .</p> </div> <div data-bbox="370 905 1146 1157"> <h3>Check traffic now & later</h3> <p>To reach your destination as quickly as possible, check typical traffic before you drive. You can avoid the busiest times of day.</p> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. Search for a destination, or tap a place on the map. 3. At the bottom, tap Directions. 4. At the top, tap Driving . 5. At the bottom, tap the white bar to display: <ul style="list-style-type: none"> • The current traffic on your route • Typical traffic by the hour and any slowdowns on the way </div> <div data-bbox="370 1163 1154 1331"> <h3>Change the mode of transportation for part of your trip</h3> <p>Tip: Only available on mobile and in some locations.</p> <p>You can combine different modes of transportation, like driving, ride-sharing, or bicycling with transit on the same trip.</p> <p>Once you've selected your route and can view the directions, you may be able to change how you travel for part of your trip. The rest of the route, like transit departure times and total journey time, will be updated when you change the mode of transportation.</p> </div> <p>Attachment 36 (Plan your commute or trip) at 1&2.</p>




Claim 1	Corresponding Structure in Accused Systems
	 <p>Navigation Information displayed to user by the processor on the wireless communication device (Exhibit-B) based on destination entered by the user.</p> <p>Attachment 25 (Use Google Maps - Samsung Galaxy S20 Ultra 5G) at 6.</p>
<p>at least one second radio-frequency transceiver and an associated at least one second antenna of the wireless communications network to which the second radio-frequency transceiver is coupled; and</p>	<p>Plaintiff contends each Accused System includes at least one item listed on Exhibit A, each of which is a base station and each of which is coupled to at least one antenna. Base station includes radio-frequency transceivers designed and used for radio-frequency communication with at least one antenna. When base-station transceivers and antennas are in communication, they are coupled. Further, in addition to being so coupled, the transceivers and antenna of each Exhibit-A item are also, by placement within a base station, physically coupled.</p> <p>The cell of the wireless communications network include base stations for transmission and reception of wireless signals to and from the mobile wireless communication devices or UEs or user devices (mobile phones, laptops, tablets, PDAs etc.). These base stations are, therefore, RF transceivers. Also, these base stations are coupled with at least one antenna for the function of transmission and reception.</p> <p>The following exemplifies this limitation's existence in Accused Systems:</p>

Claim 1	Corresponding Structure in Accused Systems
	 <p>How Maps finds your current location</p> <p>Maps estimates where you are from sources like:</p> <ul style="list-style-type: none"> • GPS: This uses satellites and knows your location within a few meters. • Wi-Fi: The location of nearby Wi-Fi networks helps Maps know where you are. • Cell tower: Your connection to a cellular network can be accurate up to a few thousand meters. <p>Attachment 8 (How map find your current location) at 2.</p> <p>Knowing where the user is allows your application to be smarter and deliver better information to the user. When developing a location-aware application for Android, you can utilize GPS and Android's Network Location Provider to acquire the user location. Although GPS is most accurate, it only works outdoors, it quickly consumes battery power, and doesn't return the location as quickly as users want.</p> <p>Android's Network Location Provider determines user location using cell tower and Wi-Fi signals, providing location information in a way that works indoors and outdoors, responds faster, and uses less battery power. To obtain the user location in your application, you can use both GPS and the Network Location Provider, or just one.</p> <p>Attachment 12 (Location of the device determined using cell tower) at 1&2.</p> <p>Google Maps provides location information based on cell towers/Wi-Fi nodes which form part of cellular communication network. These cell towers are radio frequency transceivers with antenna (Exhibit A).</p> <p>Introduction</p> <p>The Geolocation API returns a location and accuracy radius based on information about cell towers and WiFi nodes that the mobile client can detect. This document describes the protocol used to send this data to the server and to return a response to the client.</p> <p>Communication is done over HTTPS using POST. Both request and response are formatted as JSON, and the content type of both is <code>application/json</code>.</p> <p>Attachment 17 (Cell Towers/Wi-Fi Nodes (RF transceivers) in a wireless communication network) at 1</p>

Claim 1	Corresponding Structure in Accused Systems
	<p>The first parameter in <code>requestLocationUpdates()</code> is the <code>type of location provider to use (in this case, the Network Location Provider for cell tower and Wi-Fi based location)</code>. You can control the frequency at which your listener receives updates with the second and third parameter—the second is the minimum time interval between notifications and the third is the minimum change in distance between notifications—setting both to zero requests location notifications as frequently as possible. The last parameter is your <code>LocationListener</code>, which receives callbacks for location updates.</p> <p>To request location updates from the GPS provider, use <code>GPS_PROVIDER</code> instead of <code>NETWORK_PROVIDER</code>. You can also request location updates from both the GPS and the Network Location Provider by calling <code>requestLocationUpdates()</code> twice—once for <code>NETWORK_PROVIDER</code> and once for <code>GPS_PROVIDER</code>.</p> <p>Requesting User Permission</p> <p>In order to receive location updates from <code>NETWORK_PROVIDER</code> or <code>GPS_PROVIDER</code>, your application must request the user's permission by declaring either the <code>ACCESS_COARSE_LOCATION</code> or <code>ACCESS_FINE_LOCATION</code> permission, respectively, in your Android manifest file. Without these permissions, your application will fail at runtime when requesting location updates.</p> <p>If you are using both <code>NETWORK_PROVIDER</code> and <code>GPS_PROVIDER</code>, then you need to request only the <code>ACCESS_FINE_LOCATION</code> permission, because it includes permission for both providers. Permission for <code>ACCESS_COARSE_LOCATION</code> allows access only to <code>NETWORK_PROVIDER</code>.</p> <p>Attachment 12 (Location is estimated using cell tower/wi-fi network) at 3 & 4.</p> <p>Help your phone get a more accurate location (Google Location Services a.k.a. Google Location Accuracy)</p> <p>Turn your phone's location accuracy on or off</p> <ol style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Location > Advanced > Google Location Accuracy. 3. Turn Improve Location Accuracy on or off. <hr/> <p>When Google Location Accuracy is on ^</p> <p>When you have Google Location Accuracy turned on, your phone uses these sources to get the most accurate location:</p> <ul style="list-style-type: none"> • GPS • Wi-Fi • Mobile networks • Sensors <p>Wireless communication device receive the location of the Wireless communication device (Exhibit B) on Google Map from Wireless communication networks (e.g. Verizon, AT&T, T-Mobile, etc.)</p> <hr/> <p>When Google Location Accuracy is off v</p> <hr/> <p>Let your phone scan for nearby networks or devices</p> <p>To help apps get better location info, you can let your phone scan for nearby Wi-Fi access points or Bluetooth devices.</p> <ol style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Location > Wi-Fi and Bluetooth scanning. 3. Turn Wi-Fi scanning or Bluetooth scanning on or off.

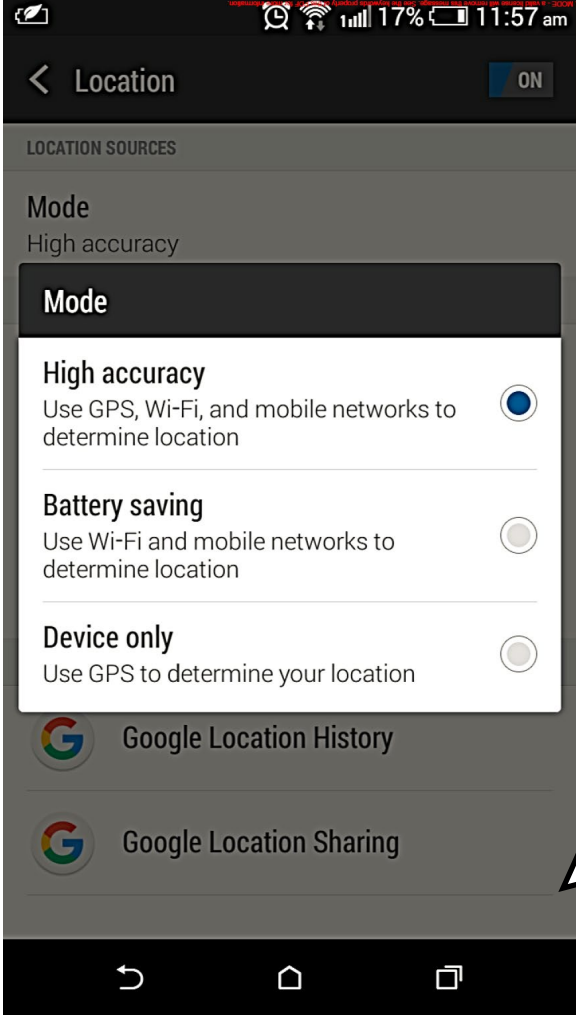
Claim 1	Corresponding Structure in Accused Systems
	<p>Attachment 21 (Manage your Pixel phone's location settings) at 2.</p> <ol style="list-style-type: none"> 1. On your Android device, go to Settings 2. Tap Location and re-enable your location services 3. Select Mode High accuracy <div data-bbox="597 464 1198 835"> <p>The user of the wireless device can select the method of the location estimation</p> </div> <p>On some phone models, this option can be found under the Advanced Settings option.</p> <p>Select Advanced Settings and enable your device to improve positioning accuracy by allowing apps to scan for Wi-Fi networks and Bluetooth devices at any time, even if Wi-Fi or Bluetooth is disabled.</p> <div data-bbox="597 1029 1198 1409"> </div> <p>Attachment 33 (Google Maps Not Updating Location) at 4.</p>



Claim 1	Corresponding Structure in Accused Systems
<p>a second processor coupled to the at least one second radio-frequency transceiver programmed to acquire the information indicative of a location of the wireless mobile communications device,</p>	<p>Plaintiff contends that Google Maps has one or more processors that determine(s) the location of wireless mobile communications devices. These processors communicatively coupled to the second RF transceiver(s) and are programmed to determine a wireless mobile communication device's location.</p> <p>Wireless mobile communications devices can, through the second RF transceiver(s), communicatively connect to and use Google Maps. Google Maps' processors can determine the device's current location and direction from that location/source to any destination. The processors are programmed to estimate the location of the device from 3 sources: GPS (GPS uses satellites and knows your location within a few meters), Wi-Fi (the location of nearby Wi-Fi networks helps Maps know where you are), and cell towers (cell tower can be accurate up to a few thousand meters).</p> <p>The following exemplifies this limitation's existence in Accused Systems:</p>  <p>Attachment 8 (How map find your current location) at 2.</p>  <p>Attachment 18 (method of estimate the location of the device) at 1.</p>


Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="380 260 492 296">Settings</div> <div data-bbox="727 254 1146 342">Google map estimates the location of the device from 3 sources: GPS, Wi-Fi and cell towers</div> <div data-bbox="380 348 540 384">Location</div> <div data-bbox="380 405 1305 468">Location services use a combination of GPS, mobile network and Wi-Fi to determine the location of your device.</div> <div data-bbox="406 491 849 564"> <ol style="list-style-type: none"> 1. From Settings, tap  Location. 2. Tap  to turn on Location services. </div> <div data-bbox="380 583 1260 621"> TIP Some apps require location services be turned on for full functionality.</div> <p>Attachment 15 (Turn ON/OFF the location setting) at 161.</p> <p>Knowing where the user is allows your application to be smarter and deliver better information to the user. When developing a location-aware application for Android, you can utilize GPS and Android's Network Location Provider to acquire the user location. Although GPS is most accurate, it only works outdoors, it quickly consumes battery power, and doesn't return the location as quickly as users want.</p> <p>Android's Network Location Provider determines user location using cell tower and Wi-Fi signals, providing location information in a way that works indoors and outdoors, responds faster, and uses less battery power. To obtain the user location in your application, you can use both GPS and the Network Location Provider, or just one.</p> <p>Attachment 12 (Location of the device determine using cell tower) at 1&2.</p> <div data-bbox="701 1163 1255 1312">Google Maps provides location information based on cell towers/Wi-Fi nodes which form part of cellular communication network. These cell towers are radio frequency transceivers with antenna (Exhibit A).</div> <div data-bbox="362 1297 542 1335">Introduction</div> <div data-bbox="362 1396 1484 1514">The Geolocation API returns a location and accuracy radius based on information about cell towers and WiFi nodes that the mobile client can detect. This document describes the protocol used to send this data to the server and to return a response to the client.</div> <p>Communication is done over HTTPS using POST. Both request and response are formatted as JSON, and the content type of both is <code>application/json</code>.</p> <p>Attachment 17 (Cell Towers/Wi-Fi Nodes (RF transceivers) in a wireless communication network) at 1.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p>The first parameter in <code>requestLocationUpdates()</code> is the <code>type of location provider to use (in this case, the Network Location Provider for cell tower and Wi-Fi based location)</code>. You can control the frequency at which your listener receives updates with the second and third parameter—the second is the minimum time interval between notifications and the third is the minimum change in distance between notifications—setting both to zero requests location notifications as frequently as possible. The last parameter is your <code>LocationListener</code>, which receives callbacks for location updates.</p> <p>To request location updates from the GPS provider, use <code>GPS_PROVIDER</code> instead of <code>NETWORK_PROVIDER</code>. You can also request location updates from both the GPS and the Network Location Provider by calling <code>requestLocationUpdates()</code> twice—once for <code>NETWORK_PROVIDER</code> and once for <code>GPS_PROVIDER</code>.</p> <p>Requesting User Permissions</p> <p>In order to receive location updates from <code>NETWORK_PROVIDER</code>, your application must request the <code>ACCESS_COARSE_LOCATION</code> or <code>ACCESS_FINE_LOCATION</code> permission, respectively, in your Android manifest file. Without these permissions, your application will fail at runtime when requesting location updates.</p> <p>If you are using both <code>NETWORK_PROVIDER</code> and <code>GPS_PROVIDER</code>, then you need to request only the <code>ACCESS_FINE_LOCATION</code> permission, because it includes permission for both providers. Permission for <code>ACCESS_COARSE_LOCATION</code> allows access only to <code>NETWORK_PROVIDER</code>.</p> <p>Attachment 12 (Location is estimated using cell tower/wi-fi network) at 3 & 4.</p> <p>Help your phone get a more accurate location (Google Location Services a.k.a. Google Location Accuracy)</p> <p>Turn your phone's location accuracy on or off</p> <ol style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Location > Advanced > Google Location Accuracy. 3. Turn Improve Location Accuracy on or off. <hr/> <p>When Google Location Accuracy is on ^</p> <p>When you have Google Location Accuracy turned on, your phone uses these sources to get the most accurate location:</p> <ul style="list-style-type: none"> • GPS • Wi-Fi • Mobile networks • Sensors <p>Wireless communication device receive the location of the Wireless communication device (Exhibit B) on Google Map from Wireless communication networks (e.g. Verizon, AT&T, T-Mobile, etc.)</p> <hr/> <p>When Google Location Accuracy is off v</p> <hr/> <p>Let your phone scan for nearby networks or devices</p> <p>To help apps get better location info, you can let your phone scan for nearby Wi-Fi access points or Bluetooth devices.</p> <ol style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Location > Wi-Fi and Bluetooth scanning. 3. Turn Wi-Fi scanning or Bluetooth scanning on or off. <p>Attachment 21 (Manage your Pixel phone's location settings) at 2.</p>

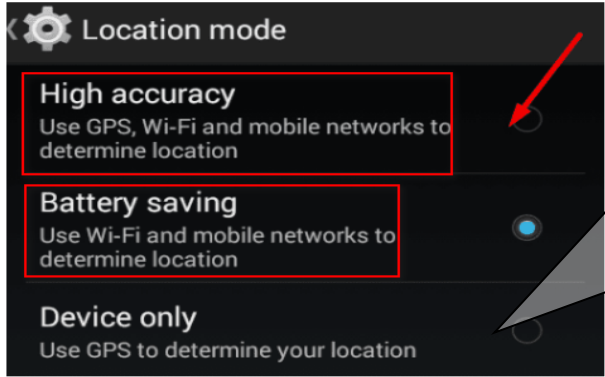
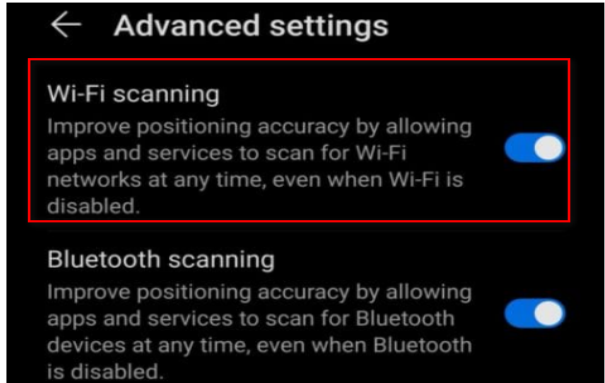
Claim 1	Corresponding Structure in Accused Systems
	<p>1. On your Android device, go to Settings</p> <p>2. Tap Location and re-enable your location services</p> <p>3. Select Mode High accuracy</p> <div data-bbox="597 415 1198 787"> </div> <p>On some phone models, this option can be found under the Advanced Settings option.</p> <p>Select Advanced Settings and enable your device to improve positioning accuracy by allowing apps to scan for Wi-Fi networks and Bluetooth devices at any time, even if Wi-Fi or Bluetooth is disabled.</p> <div data-bbox="597 980 1198 1358"> </div> <p>Attachment 33 (Google Maps Not Updating Location) at 4.</p>

Claim 1	Corresponding Structure in Accused Systems
	 <p>By default the “Location setting” is set at “High accuracy” mode, wherein, for example, accuracy of location of a communications device determined based on locations of nearby Wi-Fi network infrastructure (access points or hotspots) is further enhanced or fine-tuned by Google Maps Server additionally using the said communications device’s GPS location and the location data obtained from the mobile network (Cell tower information and/or Location of the communications device determined through the Assisted-GPS method by the said mobile network) serving the said communications device.</p> <p>Attachment 45 (Google Maps_Android app_Location settings) at 1.</p>

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="370 258 1317 315"> <h2>Find and improve your location's accuracy</h2> </div> <div data-bbox="370 331 1445 426"> <p>Sometimes Google Maps might have trouble finding where you are located. If the GPS location of your blue dot on the map is inaccurate or the blue dot is not showing up, here are some things you can do to help fix the problem.</p> </div> <div data-bbox="370 451 1179 480"> <p>Tip: This will also improve your search results and make them more relevant to you.</p> </div> <div data-bbox="389 558 805 588"> <p>Computer Android iPhone & iPad</p> </div> <div data-bbox="370 676 1002 718"> <h3>See your current location on the map</h3> </div> <div data-bbox="375 739 1440 861"> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. You'll see a blue dot, which shows where you are. If you don't see a blue dot, go to the bottom and tap Your location . </div> <div data-bbox="370 919 1006 961"> <h3>How Maps finds your current location</h3> </div> <div data-bbox="370 982 850 1012"> <p>Maps estimates where you are from sources like:</p> </div> <div data-bbox="370 1033 1466 1178"> <ul style="list-style-type: none"> • GPS: This uses satellites and knows your location up to around 20 meters. Note: When you're inside buildings or underground, the GPS is sometimes inaccurate. • Wi-Fi: The location of nearby Wi-Fi networks helps Maps know where you are. • Cell tower: Your connection to a cellular network can be accurate up to a few thousand meters. </div> <div data-bbox="354 1188 1494 1251"> <p>Attachment 46 (Find and improve your location's accuracy - Android - Google Maps Help) at 1.</p> </div>

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="370 249 607 277">From your devices</p> <p data-bbox="370 306 1469 447">Many devices, like phones or computers, can work out their precise location. You can allow Google and other apps to provide you with useful features based on where your device is located. For example, if you're running late to meet your friends, you'll probably want to use a navigation app to know the quickest way to get to your destination. To get turn-by-turn directions, you may need to turn on your device's location and give the app the permission to access it. Or for some searches like "coffee shop", "bus stop" or "atm", results will usually be more helpful when precise location is available.</p> <p data-bbox="370 489 1455 609">On your Android device, if you choose to turn on your device location, you can use features like navigation, giving an app access to your current location, or find your phone. You can also choose which apps have permission to use your device's location with simple controls that let you turn the permission on or off for individual apps. On Android, you can see when an app is requesting to use your phone's GPS-based location when the top of your screen shows Location  Learn more</p> <p data-bbox="428 634 672 657">Google Location Services</p> <p data-bbox="428 697 1406 896">On most Android devices, Google, as the network location provider, provides a location service called Google Location Services (GLS), known in Android 9 and above as Google Location Accuracy. This service aims to provide a more accurate device location and generally improve location accuracy. Most mobile phones are equipped with GPS, which uses signals from satellites to determine a device's location – however, with Google Location Services, additional information from nearby Wi-Fi, mobile networks, and device sensors can be collected to determine your device's location. It does this by periodically collecting location data from your device and using it in an anonymous way to improve location accuracy.</p> <p data-bbox="428 938 1406 1050">You can disable Google Location Services at any time in your device's location settings. Your device's location will continue to work even if GLS is turned off, but the device will rely only on GPS to estimate device location for apps with the necessary permission. Google Location Services is distinct from your device's location setting. Learn more</p> <p data-bbox="370 1098 1450 1180">The settings and permissions on Android control whether your device sensors (like GPS) or network-based location (like GLS) are used to determine your location and which apps have access to that location. They do not impact how websites and apps might estimate your location in other ways, such as from your IP Address.</p> <p data-bbox="358 1205 1461 1268">Attachment 44 (How Google uses location information – Privacy & Terms – Google) at 2 &3.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="427 239 914 268">If you use an older Android version</p> <p data-bbox="446 296 805 319">Choose location settings (Android 9.0) ^</p> <p data-bbox="467 342 699 361">To change location settings:</p> <ol data-bbox="475 373 846 441" style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Security & Location > Location. <ul data-bbox="496 420 846 441" style="list-style-type: none"> • If you have a work profile, tap Advanced. <p data-bbox="467 455 665 474">Then, choose an option:</p> <ul data-bbox="475 485 1312 592" style="list-style-type: none"> • Turn Location on or off: Tap Location. • Scan for nearby networks: Tap Advanced > Scanning. Turn Wi-Fi scanning or Bluetooth scanning on or off. • Turn emergency location service on or off: Tap Advanced > Google Emergency Location Service. Turn Emergency Location Service on or off. <p data-bbox="446 642 829 665">Choose location mode (Android 4.4–8.1) ^</p> <p data-bbox="467 686 1114 707">You can choose your location mode based on accuracy, speed, and battery use.</p> <ol data-bbox="475 720 1213 787" style="list-style-type: none"> 1. Open your phone's Settings app. 2. Tap Security & Location > Location. If you don't see "Security & Location," tap Location. 3. Tap Mode. Then pick: <ul data-bbox="496 791 1300 919" style="list-style-type: none"> • High accuracy: Use GPS, Wi-Fi, mobile networks, and sensors to get the most accurate location. Use Google Location Services to help estimate your phone's location faster and more accurately. • Battery saving: Use sources that use less battery, like Wi-Fi and mobile networks. Use Google Location Services to help estimate your phone's location faster and more accurately. • Device only: Use only GPS. Don't use Google Location Services to provide location information. This can estimate your phone's location more slowly and use more battery. <p data-bbox="446 968 842 991">Choose location access (Android 4.1–4.3) ^</p> <p data-bbox="467 1012 979 1033">You can control what location information your phone can use.</p> <ol data-bbox="475 1045 992 1113" style="list-style-type: none"> 1. Open your phone's Settings app. 2. Under "Personal," tap Location access. 3. At the top of the screen, turn Access to my location on or off. <ul data-bbox="496 1117 1312 1268" style="list-style-type: none"> • When location access is on, pick either or both of: <ul data-bbox="518 1138 1312 1224" style="list-style-type: none"> • GPS satellites: Lets your phone estimate its location from satellite signals, like a GPS device in a car. • Wi-Fi & mobile network location: Lets your phone use Google Location Services to help estimate its location faster, with or without GPS. • When location access is off: Your phone can't find its precise location or share it with any apps. <p data-bbox="467 1278 1315 1318">Tip: If you have a tablet that more than one person uses, each person can have different location access settings.</p> <p data-bbox="358 1344 1232 1373">Attachment 40 (Manage your Pixel phone's location settings) at 3 & 4.</p>

Claim 1	Corresponding Structure in Accused Systems
	<ol style="list-style-type: none"> 1. On your Android device, go to Settings 2. Tap Location and re-enable your location services 3. Select Mode High accuracy <div data-bbox="597 365 1198 739">  </div> <div data-bbox="1208 359 1433 709"> <p>The user of the wireless device can select the method of the location estimation</p> </div> <p>On some phone models, this option can be found under the Advanced Settings option.</p> <p>Select Advanced Settings and enable your device to improve positioning accuracy by allowing apps to scan for Wi-Fi networks and Bluetooth devices at any time, even if Wi-Fi or Bluetooth is disabled.</p> <div data-bbox="597 930 1198 1310">  </div> <p>Attachment 33 (Google Maps Not Updating Location) at 4.</p>

Claim 1**Corresponding Structure in Accused Systems**

	DESCRIPTION	OPT-IN / OPT-OUT	USER CHOICES
LOCATION SERVICES	"Use Google's location service to help apps determine your location. Anonymous location data will be sent to Google when your device is on."	Opt-Out	"YES, I'M IN" or "SKIP"
LOCATION ACCURACY	Three Modes: "High accuracy", "Battery saving", and "Device only". Default setting: "High accuracy use(s) GPS, Wi-Fi, Bluetooth, or cellular networks to determine location"	Opt-Out	Toggle icon (right and colored for on, left and gray for off). This setting not shown during Android set-up.
LOCATION SCANNING	"Improve location accuracy by allowing apps and services to scan for Wi-Fi and Bluetooth, even when those settings are off."	Opt-Out	Toggle icon (right and colored for on, left and gray for off).
LOCATION HISTORY	"[A]llows Google to store a history of your location data from all devices where you are logged into your Google Account and have enabled Location Reporting. Location History and Location Reporting data may be used by any Google app or service."	Opt-Out	"YES, I'M IN" or "NO THANKS" In the context of "Give your new Assistant permission to help you"

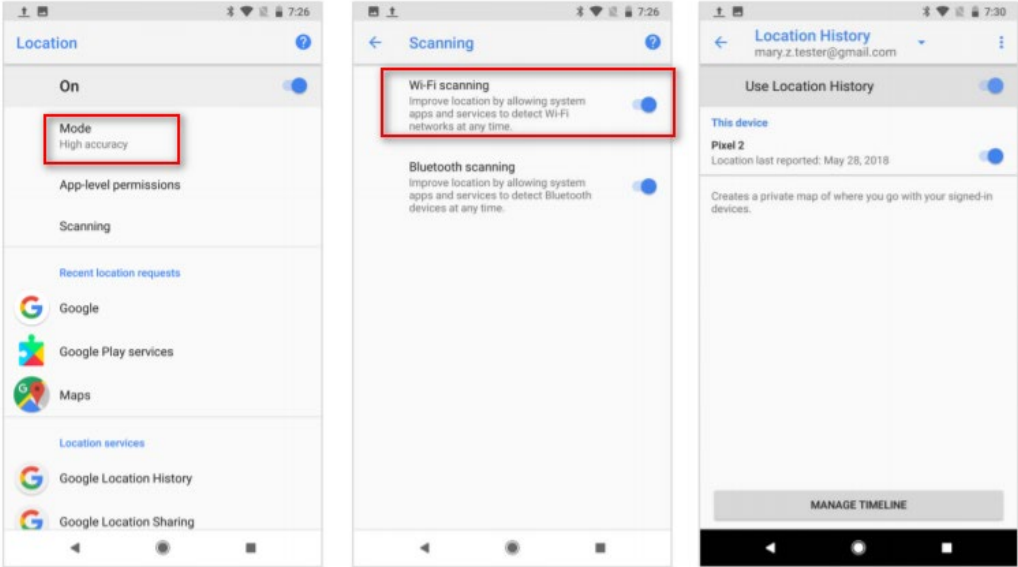
Figure 1: Four Android settings and services that relate to location information collection.¹

Google Location Services

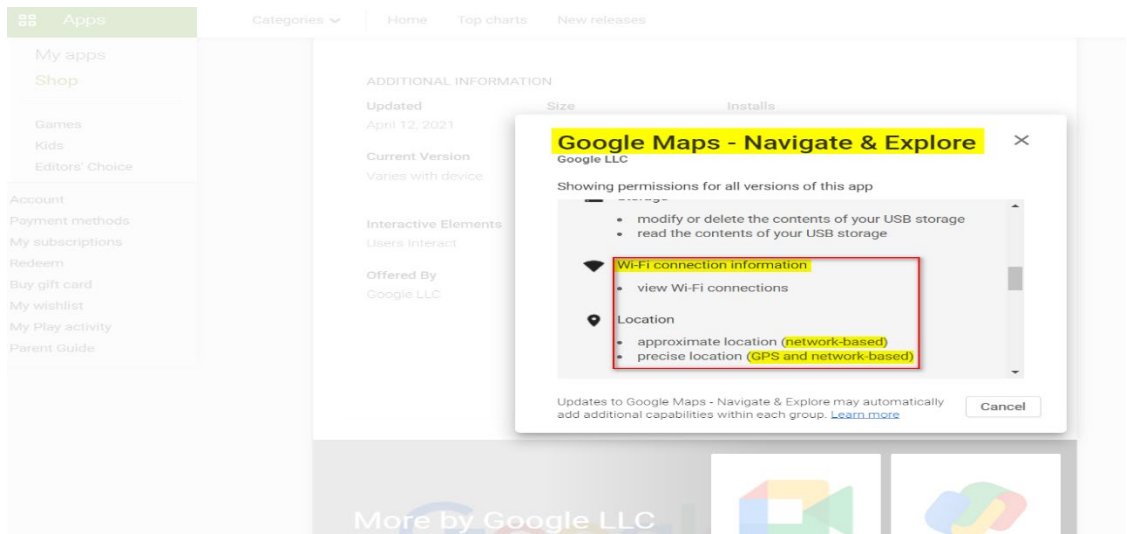
Google Location Services (GLS) operate at a device level and rely on sensors such as GPS, Wi-Fi, the cellular radio, and other technologies included in mobile devices to position a user in the world. If a user keeps the default settings prompted by Google, Location Services is enabled, Location Accuracy will be set to "High Accuracy"² and Location Scanning will be enabled for both Wi-Fi base stations and Bluetooth Beacons, regardless of a user's choice to turn Wi-Fi or Bluetooth on. The implications of user choices among the various Location Services settings are significant, but not intuitive, including:

- With Location Services turned on, Location Accuracy set to "Device only" and Location Scanning turned off, an Android device will only use GPS to provide the location of an Android device.
- When Location Accuracy is set to "High accuracy" and Location Scanning is enabled (the default setting for new device setup), an Android device will use sources including Wi-Fi, Bluetooth, and cellular radio to improve the accuracy of the device's position.

Attachment 38 (Google, Android and Location Tracking) at 2.

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="375 247 1406 310">After completing the setup process users can validate and control settings for device location via the Settings app and navigating to Google settings, then Location (Figure 4).</p> <div data-bbox="394 363 1406 926"></div> <p data-bbox="639 940 1159 963">Figure 4: Location settings after Android device setup process</p> <p data-bbox="375 991 1386 1087">As demonstrated in Figure 4, if users accept Google’s defaults during the setup process, the Android device is configured with Location Services enabled, Wi-Fi and Bluetooth scanning engaged, and Location History active.</p> <p data-bbox="358 1134 1133 1165">Attachment 38 (Google, Android and Location Tracking) at 5.</p>

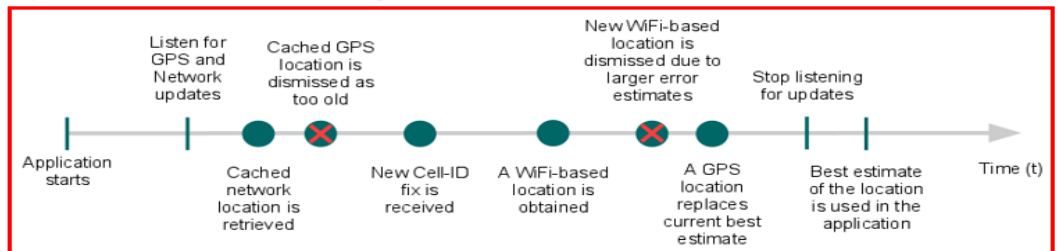
Claim 1	Corresponding Structure in Accused Systems
	<p>Users can choose to disable GLS during the set-up process. However, if a user attempts to disable GLS, a warning dialogue box prompts an extreme scenario: “device location for all apps is turned off and you may not be able to locate your device if it is lost.” (Figure 5) Note as well, the action prompt is to “Turn on Location” – reversing the user choice triggering the warning. Further, as described immediately below, many Google and third party apps will not function unless GLS is turned on. Therefore, Google forces user into an impossible ultimatum, have their every move constantly monitored, tracked, and stored or lose the functionality of their expensive smartphone.</p> <p>If a user disables Location Services but then attempts to use a location aware app or service on their device, she will see the dialogue box shown in Figure 6. If the user clicks “OK” the service is enabled for the entire device and permanently, rather than enabling Location Services only for that particular app or service requesting the functionality.</p> <div data-bbox="516 611 834 1087" data-label="Image"> </div> <p data-bbox="516 1094 834 1115">Figure 5: Location Services Warning</p> <div data-bbox="927 611 1255 1087" data-label="Image"> </div> <p data-bbox="964 1094 1218 1136">Figure 6: Re-Enable Location Services</p> <p>Attachment 38 (Google, Android and Location Tracking) at 6.</p> <p>We collect information about your location when you use our services, which helps us offer features like driving directions for your weekend getaway or showtimes for movies playing near you.</p> <p>Your location can be determined with varying degrees of accuracy by:</p> <ul style="list-style-type: none"> • GPS • IP address • Sensor data from your device • Information about things near your device, such as Wi-Fi access points, cell towers, and Bluetooth-enabled devices <p>The types of location data we collect depend in part on your device and account settings. For example, you can turn your Android device's location on or off using the device's settings app. You can also turn on Location History if you want to create a private map of where you go with your signed-in devices.</p> <p>Attachment 29 (Google Privacy Policy) at 4.</p>

Claim 1**Corresponding Structure in Accused Systems****Attachment 39 (Google Map_Permissions) at 1.****Flow for obtaining user location**




Here's the typical flow of procedures for obtaining the user location:

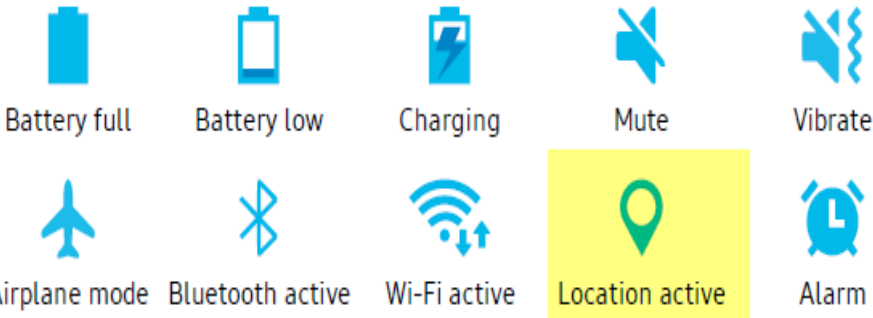
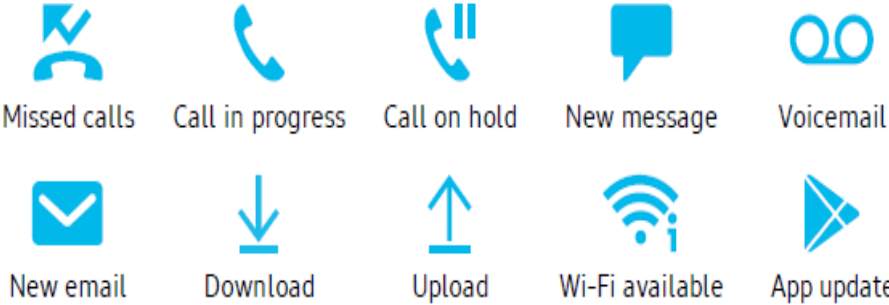
1. Start application.
2. Sometime later, start listening for updates from desired location providers.
3. Maintain a "current best estimate" of location by filtering out new, but less accurate fixes.
4. Stop listening for location updates.
5. Take advantage of the last best location estimate.

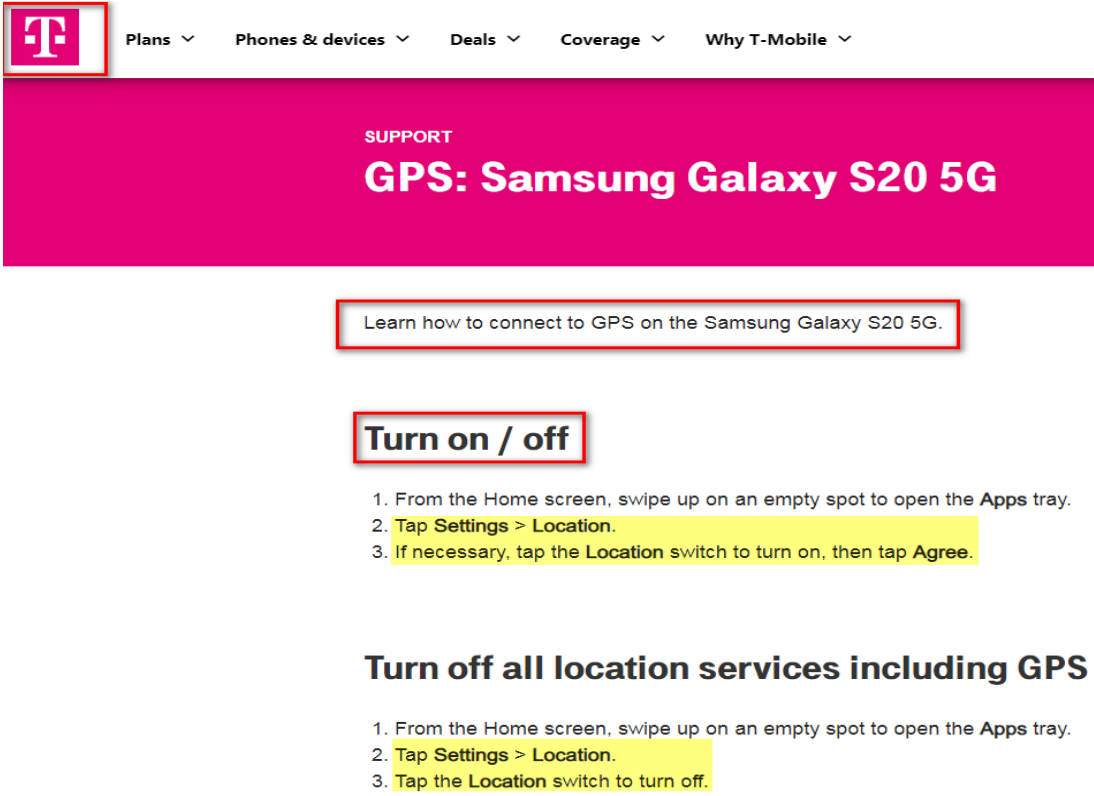
Figure 1 demonstrates this model in a timeline that visualizes the period in which an application is listening for location updates and the events that occur during that time.






**Attachment 12 (Location is estimated using cell tower/wi-fi network) at 5.**

Claim 1	Corresponding Structure in Accused Systems
	<p>There are 3 location providers in Android.</p> <p>They are:</p> <p>gps → (GPS, AGPS): Name of the GPS location provider. This provider determines location using satellites. Depending on conditions, this provider may take a while to return a location fix. Requires the permission <code>android.permission.ACCESS_FINE_LOCATION</code>.</p> <p>network → (AGPS, CellID, WiFi MACID): Name of the network location provider. This provider determines location based on availability of cell tower and WiFi access points. Results are retrieved by means of a network lookup. Requires either of the permissions <code>android.permission.ACCESS_COARSE_LOCATION</code> or <code>android.permission.ACCESS_FINE_LOCATION</code>.</p> <p>passive → (CellID, WiFi MACID): A special location provider for receiving locations without actually initiating a location fix. This provider can be used to passively receive location updates when other applications or services request them without actually requesting the locations yourself. This provider will return locations generated by other providers. Requires the permission <code>android.permission.ACCESS_FINE_LOCATION</code>, although if the GPS is not enabled this provider might only return coarse fixes. This is what Android calls these location providers, however, the underlying technologies to make this stuff work is mapped to the specific set of hardware and telco provided capabilities (network service).</p> <p>The best way is to use the “network” or “passive” provider first, and then fallback on “gps”, and depending on the task, switch between providers. This covers all cases, and provides a lowest common denominator service (in the worst case) and great service (in the best case).</p> <p>Attachment 41 (Android Location Providers - GPS or Network Provider?) at 1 & 2.</p> <p>Accuracy</p> <p>You can specify location accuracy using the <code>setPriority()</code> method, passing one of the following values as the argument:</p> <ul style="list-style-type: none"> PRIORITY_HIGH_ACCURACY provides the most accurate location possible, which is computed using as many inputs as necessary (it enables GPS, Wi-Fi, and cell, and uses a variety of <code>Sensors</code>), and may cause significant battery drain. PRIORITY_BALANCED_POWER_ACCURACY provides accurate location while optimizing for power. Very rarely uses GPS. Typically uses a combination of Wi-Fi and cell information to compute device location. PRIORITY_LOW_POWER largely relies on cell towers and avoids GPS and Wi-Fi inputs, providing coarse (city-level) accuracy with minimal battery drain. PRIORITY_NO_POWER receives locations passively from other apps for which location has already been computed. <p>The location needs of most apps can be satisfied using the balanced power or low power options. High accuracy should be reserved for apps that are running in the foreground and require <i>real time</i> location updates (for example, a mapping app).</p> <p>Attachment 42 (Optimize location for battery) at 2.</p> <p>Traffic conditions [edit]</p> <p>In 2007, Google began offering traffic data as a colored overlay on top of roads and motorways to represent the speed of vehicles on particular roads. Crowdsourcing is used to obtain the GPS-determined locations of a large number of cellphone users, from which live traffic maps are produced.^{[59][60][61]}</p> <p>Google has stated that the speed and location information it collects to calculate traffic conditions is anonymous.^[62] Options available in each phone's settings allow users not to share information about their location with Google Maps.^[63] Google stated, "Once you disable or opt out of My Location, Maps will not continue to send radio information back to Google servers to determine your handset's approximate location".^{[64][failed verification]}</p> <p>Attachment 43 (Google Maps Wikipedia) at 5 & 6.</p>

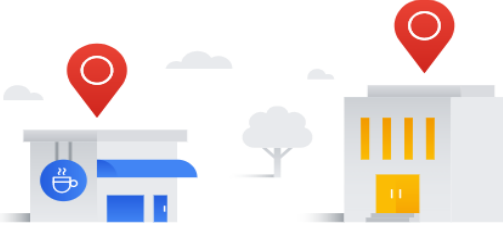
Claim 1	Corresponding Structure in Accused Systems
<p>wherein the second processor selectively acquires the information indicative of a location of the wireless mobile communications device dependent on the setting of preference flags,</p>	<p>Plaintiff contends each Exhibit-B wireless mobile can set preference flags that enable or disable accessibility to data relevant to the device's location by Location-Based Services (LBS) providers. Such programmability by a wireless device is at times known as a privacy setting. Further, such programmability is available by location-permission granting (wireless mobile communications device must grant permission).</p> <p>The LBS providers' processors select to determine a wireless mobile communications device's location if the preference flags applicable to that device have been set for enablement. The processors select to not determine a wireless mobile communications device's location if the preference flags applicable to that device have not been set for enablement.</p> <p>The following exemplifies this limitation's existence in Accused Systems:</p> <div data-bbox="373 703 492 745">Settings</div> <div data-bbox="373 793 540 835">Location</div> <div data-bbox="373 850 1318 919" style="border: 2px solid red; padding: 5px;"> <p>Location services use a combination of GPS, mobile network and Wi-Fi to determine the location of your device.</p> </div> <div data-bbox="402 934 885 1018" style="background-color: yellow; padding: 5px;"> <ol style="list-style-type: none"> 1. From Settings, tap  Location. 2. Tap  to turn on Location services. </div> <div data-bbox="373 1033 1263 1075"> <p> TIP Some apps require location services be turned on for full functionality.</p> </div> <p>Attachment 15 (Turn ON/OFF the location setting) at 161.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p>Status bar</p> <p>The Status bar provides device information on the right side and notification alerts on the left.</p> <p>Status icons</p> <div data-bbox="412 499 1279 814">  <p>Battery full Battery low Charging Mute Vibrate</p> <p>Airplane mode Bluetooth active Wi-Fi active Location active Alarm</p> </div> <p>Notification icons</p> <div data-bbox="412 932 1295 1234">  <p>Missed calls Call in progress Call on hold New message Voicemail</p> <p>New email Download Upload Wi-Fi available App update</p> </div> <p>Attachment 15 (Icon for turn ON/OFF the location setting) at 161.</p> <div data-bbox="1299 766 1510 1239" style="border: 1px solid black; border-radius: 10px; padding: 10px;"> <p>Google Map hardware/software will be able/not able to locate the Wireless communication device (Exhibit B) if "Location" flag is turned ON/OFF respectively</p> </div>

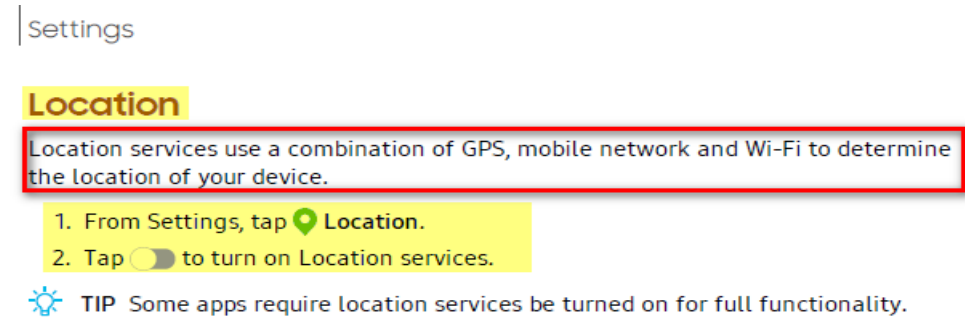

Claim 1	Corresponding Structure in Accused Systems
	 <p>The screenshot shows the T-Mobile support page for Samsung Galaxy S20 5G. The T-Mobile logo is in the top left. Navigation links include Plans, Phones & devices, Deals, Coverage, and Why T-Mobile. The main heading is 'SUPPORT GPS: Samsung Galaxy S20 5G'. Below this is a link 'Learn how to connect to GPS on the Samsung Galaxy S20 5G.' followed by a section titled 'Turn on / off'. This section contains two numbered lists of steps for turning on and turning off location services. The steps for turning on location services are: 1. From the Home screen, swipe up on an empty spot to open the Apps tray. 2. Tap Settings > Location. 3. If necessary, tap the Location switch to turn on, then tap Agree. The steps for turning off location services are: 1. From the Home screen, swipe up on an empty spot to open the Apps tray. 2. Tap Settings > Location. 3. Tap the Location switch to turn off.</p> <p>Attachment 19 (Turn ON/OFF the location) at 1.</p>

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="384 247 665 359">  </div> <div data-bbox="1193 241 1380 273"> Personal Business </div> <div data-bbox="1193 308 1505 346"> Shop Why Verizon Support </div> <hr/> <div data-bbox="389 508 1073 539"> Home > Support > Google > Google Pixel 4a > Google Pixel 4a - Turn GPS Location On / Off </div> <div data-bbox="384 625 1302 795"> <h2>Google Pixel 4a - Turn GPS Location On / Off</h2> </div> <p>  Satellite or standalone GPS services require more power and have a greater effect on battery life. </p> <ol style="list-style-type: none"> From a Home screen, swipe up to display all apps. Navigate: Settings  > Location. Tap the Use location switch to turn on  or off . → You must turn this feature on to adjust GPS services. If presented, review the disclaimer(s) then tap AGREE. <div data-bbox="1075 984 1445 1169"> <p>Google Map hardware/software will be able/not able to locate the Wireless communication device (Exhibit B) if “Location” flag is turned ON/OFF respectively</p> </div> <p>Attachment 20 (Turn ON/OFF the location) at 1.</p>




Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="380 224 1403 302">Help your phone get a more accurate location (Google Location Services a.k.a. Google Location Accuracy)</p> <p data-bbox="380 342 1003 371">Turn your phone's location accuracy on or off</p> <ol data-bbox="380 388 948 476" style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Location > Advanced > Google Location Accuracy. 3. Turn Improve Location Accuracy on or off. <hr data-bbox="380 489 1425 493"/> <p data-bbox="402 518 802 543">When Google Location Accuracy is on ^</p> <div data-bbox="428 573 1357 625"> <p>When you have Google Location Accuracy turned on, your phone uses these sources to get the most accurate location:</p> <ul data-bbox="428 642 613 764" style="list-style-type: none"> • GPS • Wi-Fi • Mobile networks • Sensors </div> <div data-bbox="850 646 1445 768"> <p>Wireless communication device receive the location of the Wireless communication device (Exhibit B) on Google Map from Wireless communication networks (e.g. Verizon, AT&T, T-Mobile, etc.)</p> </div> <hr data-bbox="380 804 1425 808"/> <p data-bbox="402 833 807 858">When Google Location Accuracy is off v</p> <hr data-bbox="380 879 1425 884"/> <p data-bbox="380 919 1097 949">Let your phone scan for nearby networks or devices</p> <p data-bbox="380 963 1383 1012">To help apps get better location info, you can let your phone scan for nearby Wi-Fi access points or Bluetooth devices.</p> <ol data-bbox="380 1033 894 1121" style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Location > Wi-Fi and Bluetooth scanning. 3. Turn Wi-Fi scanning or Bluetooth scanning on or off. <p data-bbox="358 1146 1179 1176">Attachment 21 (Manage your Pixel phone's location settings) at 2.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="386 226 690 258">Your location information</p>  <p data-bbox="386 636 1414 688">We collect information about your location when you use our services, which helps us offer features like driving directions for your weekend getaway or showtimes for movies playing near you.</p> <p data-bbox="386 732 976 756">Your location can be determined with varying degrees of accuracy by:</p> <ul data-bbox="386 795 1398 982" style="list-style-type: none"> • GPS • IP address • Sensor data from your device • Information about things near your device, such as Wi-Fi access points, cell towers, and Bluetooth-enabled devices <p data-bbox="386 1024 1422 1104">The types of location data we collect depend in part on your device and account settings. For example, you can turn your Android device's location on or off using the device's settings app. You can also turn on Location History if you want to create a private map of where you go with your signed-in devices.</p> <p data-bbox="358 1146 902 1178">Attachment 29 (Google privacy policy) at 4.</p>
<p>wherein the second processor acquires the information indicative of a location of the wireless mobile communications device if the preference flags are set to a state that permits tracking of the wireless mobile communications device,</p>	<p>Plaintiff contends each Exhibit-B wireless mobile can set preference flags that enable or disable accessibility to data relevant to the device's location by Location-Based Services (LBS) providers. The LBS providers' processors select to determine a wireless mobile communications device's location if the preference flags applicable to that device have been set for enablement. The processors select to not determine a wireless mobile communications device's location if the preference flags applicable to that device have not been set for enablement.</p> <p>The Navigation hardware/software will only be able to determine and track the location of the Wireless communication device (Exhibit B) such as but not limited to including but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list), Plaintiff contends each Exhibit-B wireless mobile can set preference flags that enable or disable accessibility to data relevant to the device's location by Location-Based Services (LBS) providers. Such programmability by a wireless device is at times known as a privacy setting. Further, such programmability is available by location-permission granting (wireless mobile communications device must grant permission).</p> <p>Plaintiff contends that if the preference flags are enabled (i.e., the wireless mobile communication device's user has granted permission), LBS providers' processors</p>




Screenshot of the "Location setting" associated with Google Maps app installed on an Android communications device.

Claim 1	Corresponding Structure in Accused Systems
	<p>proceed with determining the device's location and, when determined, communicates that location to the first processor through the second RF transceiver (which, as discussed above, is a transceiver to which the LBS-providers' processors communicatively couple). The LBS-providers' processors are programmed to estimate the location of the device from 3 sources: GPS (GPS uses satellites and knows your location within a few meters), Wi-Fi (the location of nearby Wi-Fi networks helps Maps know where you are), and cell towers (cell tower can be accurate up to a few thousand meters).</p> <p>The following exemplifies this limitation's existence in Accused Systems:</p>  <p>Attachment 15 (Turn ON/OFF the location setting) at 161.</p>  <p>Attachment 19 (Turn ON/OFF the location) at 1.</p>

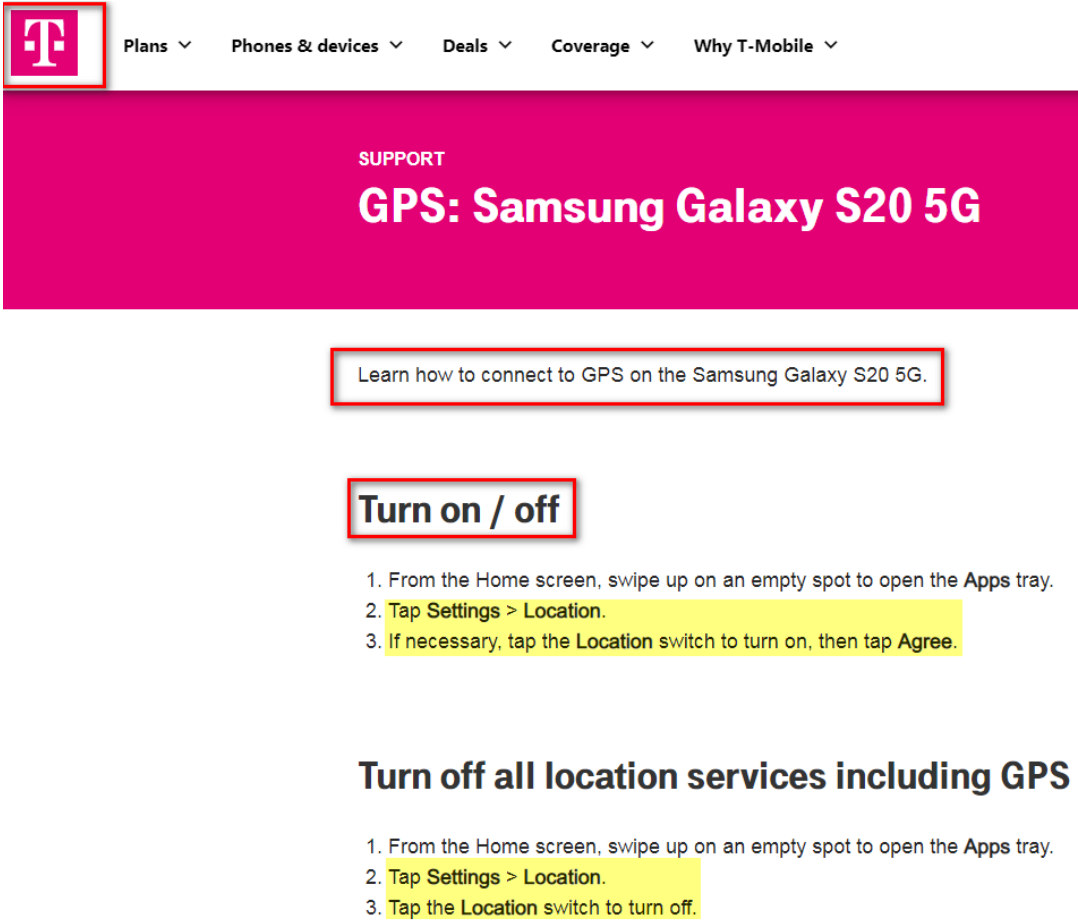
Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="375 226 686 264" data-label="Text"> <p>Your location information</p> </div> <div data-bbox="630 317 1123 541" data-label="Image"> <p>The illustration shows two stylized buildings. The building on the left is blue and white with a coffee cup icon. The building on the right is grey and white with a yellow door. Above each building is a red location pin icon. There are also some clouds and a tree in the background.</p> </div> <div data-bbox="375 625 1414 686" data-label="Text"> <p>We collect information about your location when you use our services, which helps us offer features like driving directions for your weekend getaway or showtimes for movies playing near you.</p> </div> <div data-bbox="375 720 964 747" data-label="Text"> <p>Your location can be determined with varying degrees of accuracy by:</p> </div> <div data-bbox="375 783 1382 968" data-label="List-Group"> <ul style="list-style-type: none"> • GPS • IP address • Sensor data from your device • Information about things near your device, such as Wi-Fi access points, cell towers, and Bluetooth-enabled devices </div> <div data-bbox="375 1003 1408 1087" data-label="Text"> <p>The types of location data we collect depend in part on your device and account settings. For example, you can turn your Android device's location on or off using the device's settings app. You can also turn on Location History if you want to create a private map of where you go with your signed-in devices.</p> </div> <div data-bbox="347 1121 906 1157" data-label="Text"> <p>Attachment 29 (Google privacy policy) at 4.</p> </div>




Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="384 262 665 373">  </div> <div data-bbox="1193 256 1380 289"> Personal Business </div> <div data-bbox="1193 321 1505 363"> Shop Why Verizon Support </div> <hr/> <div data-bbox="389 522 1073 556"> Home > Support > Google > Google Pixel 4a > Google Pixel 4a - Turn GPS Location On / Off </div> <div data-bbox="384 640 1302 810"> <h2>Google Pixel 4a - Turn GPS Location On / Off</h2> </div> <p>◆ Satellite or standalone GPS services require more power and have a greater effect on battery life.</p> <ol style="list-style-type: none"> From a Home screen, swipe up to display all apps. Navigate: Settings > Location. Tap the Use location switch to turn on  or off . <p>→ You must turn this feature on to adjust GPS services.</p> If presented, review the disclaimer(s) then tap AGREE. <p>Attachment 20 (Turn ON/OFF the location) at 1.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="370 233 971 275">Turn location on or off for your phone</p> <ol data-bbox="380 289 902 386" style="list-style-type: none"> 1. Open your phone's Settings app. 2. Tap Location. If you have a work profile, tap Advanced. 3. At the top, turn Use location on or off. <p data-bbox="370 407 1299 432">Tip: You can also turn your phone's location on or off with Quick Settings. Learn about Quick Settings.</p> <hr/> <p data-bbox="391 474 613 506">When Location is on</p> <ul data-bbox="423 537 1406 861" style="list-style-type: none"> • Apps can find your phone's location to give you location-based info or services. Learn how to change app location settings. • If Google Location Accuracy is on, Google Location Services can collect data to improve location-based services. Learn about Google Location Services. • You can get search results and ads in apps based on your phone's location. • You can locate where your phone is if you lose it. Learn about Find My Device. • You can share your phone's location with others. Learn about Location Sharing with Google Maps and sending location in emergencies. • If you have Location History turned on, the places your phone goes will be saved. You can review and manage them later. Learn about Location History. <p data-bbox="358 886 1050 919">Attachment 21 (Manage your pixel phone settings) at 1.</p> <p data-bbox="380 953 1369 1029">Help your phone get a more accurate location (Google Location Services a.k.a. Google Location Accuracy)</p> <p data-bbox="380 1066 984 1098">Turn your phone's location accuracy on or off</p> <ol data-bbox="386 1113 928 1199" style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Location > Advanced > Google Location Accuracy. 3. Turn Improve Location Accuracy on or off. <hr/> <p data-bbox="402 1239 789 1264">When Google Location Accuracy is on ⬆</p> <div data-bbox="423 1291 1326 1344"> <p>When you have Google Location Accuracy turned on, your phone uses these sources to get the most accurate location:</p> <ul data-bbox="431 1360 610 1478" style="list-style-type: none"> • GPS • Wi-Fi • Mobile networks • Sensors </div> <div data-bbox="889 1348 1325 1528"> <p>Wireless communication device receive the location of the Wireless communication device (Exhibit B) on Google Map from Wireless communication networks (e.g. Verizon, AT&T, T-Mobile, etc.)</p> </div> <hr/> <p data-bbox="402 1543 794 1568">When Google Location Accuracy is off ⬆</p> <hr/> <p data-bbox="380 1627 1076 1659">Let your phone scan for nearby networks or devices</p> <p data-bbox="380 1671 1352 1719">To help apps get better location info, you can let your phone scan for nearby Wi-Fi access points or Bluetooth devices.</p> <ol data-bbox="386 1738 876 1824" style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Location > Wi-Fi and Bluetooth scanning. 3. Turn Wi-Fi scanning or Bluetooth scanning on or off. <p data-bbox="358 1848 1180 1881">Attachment 21 (Manage your Pixel phone's location settings) at 2.</p>



Claim 1	Corresponding Structure in Accused Systems
<p>and wherein the second processor does not acquire the information indicative of the location of the wireless mobile communications device if the preference flags are set to a state that prohibits tracking of the wireless mobile communications device.</p>	<p>Plaintiff contends that if the preference flags are not enabled (i.e., the wireless-mobile-communication device's user has not granted permission), LBS provider application hardware/software, will not be able to determine and track the location of the Wireless communication device (Exhibit B) such as but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list), if the location flag on the Wireless communication device (Exhibit B) is turned off (that is, locations privacy settings are set to "Deny").</p> <p>The following exemplifies this limitation's existence in Accused Systems:</p> <div data-bbox="373 667 492 709">Settings</div> <div data-bbox="373 772 540 814">Location</div> <div data-bbox="373 835 1307 909" style="border: 2px solid red; padding: 5px;"> Location services use a combination of GPS, mobile network and Wi-Fi to determine the location of your device. </div> <div data-bbox="402 930 885 1024" style="background-color: yellow; padding: 5px;"> 1. From Settings, tap  Location. 2. Tap  to turn on Location services. </div> <div data-bbox="373 1045 1258 1087">  TIP Some apps require location services be turned on for full functionality. </div> <p>Attachment 15 (Turn ON/OFF the location setting) at 161.</p>


Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="378 226 699 268" data-label="Text"> <p>Your location information</p> </div> <div data-bbox="643 323 1156 554" data-label="Image"> <p>The illustration shows two stylized buildings. The building on the left is blue and white with a coffee cup icon. The building on the right is grey and white with a yellow door. Above each building is a red location pin icon. There are also some clouds and a tree in the background.</p> </div> <div data-bbox="378 636 1455 705" data-label="Text"> <p>We collect information about your location when you use our services, which helps us offer features like driving directions for your weekend getaway or showtimes for movies playing near you.</p> </div> <div data-bbox="378 741 989 768" data-label="Text"> <p>Your location can be determined with varying degrees of accuracy by:</p> </div> <div data-bbox="378 806 1424 997" data-label="List-Group"> <ul style="list-style-type: none"> • GPS • IP address • Sensor data from your device • Information about things near your device, such as Wi-Fi access points, cell towers, and Bluetooth-enabled devices </div> <div data-bbox="378 1035 1456 1123" data-label="Text"> <p>The types of location data we collect depend in part on your device and account settings. For example, you can turn your Android device's location on or off using the device's settings app. You can also turn on Location History if you want to create a private map of where you go with your signed-in devices.</p> </div> <div data-bbox="349 1159 906 1194" data-label="Text"> <p>Attachment 29 (Google privacy policy) at 4.</p> </div>

Claim 1	Corresponding Structure in Accused Systems
	 <p>The screenshot shows the T-Mobile support page for Samsung Galaxy S20 5G. The page has a pink header with the T-Mobile logo and navigation links: Plans, Phones & devices, Deals, Coverage, and Why T-Mobile. Below the header, the word 'SUPPORT' is followed by the title 'GPS: Samsung Galaxy S20 5G'. A red box highlights the text 'Learn how to connect to GPS on the Samsung Galaxy S20 5G.' Below this, another red box highlights the section 'Turn on / off'. Under this section, three steps are listed: 1. From the Home screen, swipe up on an empty spot to open the Apps tray. 2. Tap Settings > Location. 3. If necessary, tap the Location switch to turn on, then tap Agree. Below this, the section 'Turn off all location services including GPS' is shown with three steps: 1. From the Home screen, swipe up on an empty spot to open the Apps tray. 2. Tap Settings > Location. 3. Tap the Location switch to turn off.</p> <p>Attachment 19 (Turn ON/OFF the location) at 1.</p>

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="383 247 665 359">  </div> <div data-bbox="1193 241 1507 346"> <p>Personal Business</p> <p>Shop Why Verizon Support</p> </div> <div data-bbox="389 510 1071 541"> <p>Home > Support > Google > Google Pixel 4a > Google Pixel 4a - Turn GPS Location On / Off</p> </div> <div data-bbox="386 627 1300 798"> <h2>Google Pixel 4a - Turn GPS Location On / Off</h2> </div> <div data-bbox="389 905 1237 949"> <p>◆ Satellite or standalone GPS services require more power and have a greater effect on battery life.</p> </div> <div data-bbox="389 980 906 1234"> <ol style="list-style-type: none"> 1. From a Home screen, swipe up to display all apps. 2. Navigate: Settings > Location. 3. Tap the Use location switch to turn on  or off . → You must turn this feature on to adjust GPS services. 4. If presented, review the disclaimer(s) then tap AGREE. </div> <div data-bbox="1198 978 1409 1281"> <p>Google Map hardware/software will be not able to locate the Wireless communication device (Exhibit B) if "Location" flag is turned OFF</p> </div> <div data-bbox="350 1302 967 1337"> <p>Attachment 20 (Turn ON/OFF the location) at 1.</p> </div> <div data-bbox="786 1455 1391 1484"> <p>Manage your Pixel phone's location settings - Pixel Phone Help</p> </div> <div data-bbox="357 1518 584 1549"> <p>When Location is off</p> </div> <div data-bbox="386 1577 1346 1869"> <ul style="list-style-type: none"> • Your phone's location isn't shared with any apps. Features that use location may not work properly. • Google Location Services won't collect data to improve location-based services. • You can get search results and ads based on your IP address. • You can't see where your phone is if you lose it. Learn about Find My Device. • You can't share your phone's location with anyone via Google Maps. Your device can still send it to first responders in an emergency. Learn about Location Sharing with Google Maps and sending location in emergencies. • Even if you have Location History turned on, the places your phone goes won't be saved. Learn about Location History. </div>

Claim 1	Corresponding Structure in Accused Systems
	<p>Attachment 21 (Manage your pixel phone settings) at 1.</p> <div data-bbox="358 569 930 1583"> <p>The screenshot shows the 'Location' settings page on an Android phone. At the top, there's a back arrow and the word 'Location', followed by an 'ON' toggle. Below this is a section titled 'LOCATION SOURCES'. Underneath, the 'Mode' is set to 'High accuracy'. A dropdown menu is open, showing three options: 'High accuracy' (selected with a blue circle), 'Battery saving', and 'Device only'. Each option has a brief description of how it determines location. Below the modes are sections for 'Google Location History' and 'Google Location Sharing'. At the bottom are navigation icons for back, home, and recent apps.</p> </div> <div data-bbox="1036 636 1474 1556"> <p>By default the “Location setting” is set at “High accuracy” mode, wherein, for example, accuracy of location of a communications device determined based on locations of nearby Wi-Fi network infrastructure (access points or hotspots) is further enhanced or fine-tuned by Google Maps Server additionally using the said communications device’s GPS location and the location data obtained from the mobile network (Cell tower information and/or Location of the communications device determined through the Assisted-GPS method by the said mobile network) serving the said communications device.</p> </div> <p>Attachment 45 (Google Maps_Android app_Location settings) at 1.</p>

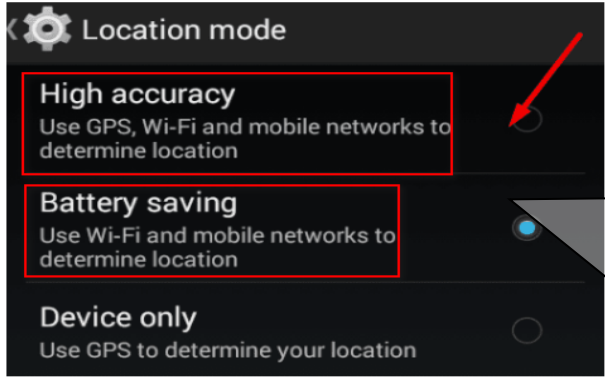
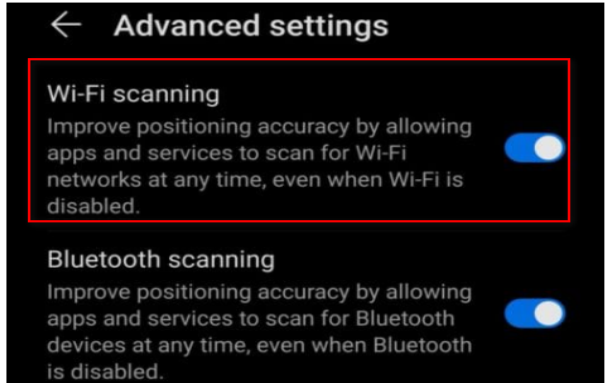
Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="375 258 1312 315">Find and improve your location's accuracy</p> <p data-bbox="375 331 1442 426">Sometimes Google Maps might have trouble finding where you are located. If the GPS location of your blue dot on the map is inaccurate or the blue dot is not showing up, here are some things you can do to help fix the problem.</p> <p data-bbox="375 451 1175 478">Tip: This will also improve your search results and make them more relevant to you.</p> <div data-bbox="394 558 802 585"> <p>Computer Android iPhone & iPad</p> </div> <hr data-bbox="375 613 1468 617"/> <p data-bbox="375 676 1000 718">See your current location on the map</p> <ol data-bbox="375 739 1430 858" style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. You'll see a blue dot, which shows where you are. If you don't see a blue dot, go to the bottom and tap Your location . <p data-bbox="375 919 1000 961">How Maps finds your current location</p> <p data-bbox="375 982 847 1010">Maps estimates where you are from sources like:</p> <ul data-bbox="375 1035 1455 1178" style="list-style-type: none"> • GPS: This uses satellites and knows your location up to around 20 meters. Note: When you're inside buildings or underground, the GPS is sometimes inaccurate. • Wi-Fi: The location of nearby Wi-Fi networks helps Maps know where you are. • Cell tower: Your connection to a cellular network can be accurate up to a few thousand meters. <p data-bbox="358 1188 1495 1249">Attachment 46 (Find and improve your location's accuracy - Android - Google Maps Help) at 1.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="370 247 597 275">From your devices</p> <p data-bbox="370 302 1409 436">Many devices, like phones or computers, can work out their precise location. You can allow Google and other apps to provide you with useful features based on where your device is located. For example, if you're running late to meet your friends, you'll probably want to use a navigation app to know the quickest way to get to your destination. To get turn-by-turn directions, you may need to turn on your device's location and give the app the permission to access it. Or for some searches like "coffee shop", "bus stop" or "atm", results will usually be more helpful when precise location is available.</p> <p data-bbox="370 476 1398 590">On your Android device, if you choose to turn on your device location, you can use features like navigation, giving an app access to your current location, or find your phone. You can also choose which apps have permission to use your device's location with simple controls that let you turn the permission on or off for individual apps. On Android, you can see when an app is requesting to use your phone's GPS-based location when the top of your screen shows Location  Learn more</p> <p data-bbox="427 615 654 642">Google Location Services</p> <p data-bbox="427 674 1354 863">On most Android devices, Google, as the network location provider, provides a location service called Google Location Services (GLS), known in Android 9 and above as Google Location Accuracy. This service aims to provide a more accurate device location and generally improve location accuracy. Most mobile phones are equipped with GPS, which uses signals from satellites to determine a device's location – however, with Google Location Services, additional information from nearby Wi-Fi, mobile networks, and device sensors can be collected to determine your device's location. It does this by periodically collecting location data from your device and using it in an anonymous way to improve location accuracy.</p> <p data-bbox="427 903 1354 1008">You can disable Google Location Services at any time in your device's location settings. Your device's location will continue to work even if GLS is turned off, but the device will rely only on GPS to estimate device location for apps with the necessary permission. Google Location Services is distinct from your device's location setting. Learn more</p> <p data-bbox="370 1052 1393 1129">The settings and permissions on Android control whether your device sensors (like GPS) or network-based location (like GLS) are used to determine your location and which apps have access to that location. They do not impact how websites and apps might estimate your location in other ways, such as from your IP Address.</p> <p data-bbox="358 1157 1463 1220">Attachment 44 (How Google uses location information – Privacy & Terms – Google) at 2 &3.</p>

Wireless communication device receive the location of the Wireless communication device (Exhibit B) on Google Map from Wireless communication networks (e.g. Verizon, AT&T, T-Mobile, etc.)

Claim 1	Corresponding Structure in Accused Systems
	<p>Turn your phone's location accuracy on or off</p> <ol style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Location > Advanced > Google Location Accuracy. 3. Turn Improve Location Accuracy on or off. <hr/> <p>When Google Location Accuracy is on</p> <p>When you have Google Location Accuracy turned on, your phone uses these sources to get the most accurate location:</p> <ul style="list-style-type: none"> • GPS • Wi-Fi • Mobile networks • Sensors <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>When Google Location Accuracy is off</p> </div> <p>When you turn off Google Location Accuracy, your phone uses only GPS to find location. GPS can be slower and less accurate than other sources.</p> <p>Let your phone scan for nearby networks or devices</p> <p>To help apps get better location info, you can let your phone scan for nearby Wi-Fi access points or Bluetooth devices.</p> <ol style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Location > Wi-Fi and Bluetooth scanning. 3. Turn Wi-Fi scanning or Bluetooth scanning on or off. <p>Attachment 21 (Manage your Pixel phone's location settings) at 2.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="375 241 862 268">If you use an older Android version</p> <p data-bbox="394 298 753 319">Choose location settings (Android 9.0) ^</p> <p data-bbox="417 342 647 361">To change location settings:</p> <ol data-bbox="423 373 792 441" style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Security & Location > Location. <ul style="list-style-type: none"> • If you have a work profile, tap Advanced. <p data-bbox="417 455 612 474">Then, choose an option:</p> <ul data-bbox="423 485 1260 592" style="list-style-type: none"> • Turn Location on or off: Tap Location. • Scan for nearby networks: Tap Advanced > Scanning. Turn Wi-Fi scanning or Bluetooth scanning on or off. • Turn emergency location service on or off: Tap Advanced > Google Emergency Location Service. Turn Emergency Location Service on or off. <p data-bbox="394 642 777 663">Choose location mode (Android 4.4–8.1) ^</p> <p data-bbox="417 686 1062 705">You can choose your location mode based on accuracy, speed, and battery use.</p> <ol data-bbox="423 718 1159 785" style="list-style-type: none"> 1. Open your phone's Settings app. 2. Tap Security & Location > Location. If you don't see "Security & Location," tap Location. 3. Tap Mode. Then pick: <ul data-bbox="446 791 1247 917" style="list-style-type: none"> • High accuracy: Use GPS, Wi-Fi, mobile networks, and sensors to get the most accurate location. Use Google Location Services to help estimate your phone's location faster and more accurately. • Battery saving: Use sources that use less battery, like Wi-Fi and mobile networks. Use Google Location Services to help estimate your phone's location faster and more accurately. • Device only: Use only GPS. Don't use Google Location Services to provide location information. This can estimate your phone's location more slowly and use more battery. <p data-bbox="394 968 790 989">Choose location access (Android 4.1–4.3) ^</p> <p data-bbox="417 1012 927 1031">You can control what location information your phone can use.</p> <ol data-bbox="423 1043 938 1113" style="list-style-type: none"> 1. Open your phone's Settings app. 2. Under "Personal," tap Location access. 3. At the top of the screen, turn Access to my location on or off. <ul data-bbox="446 1117 1255 1266" style="list-style-type: none"> • When location access is on, pick either or both of: <ul style="list-style-type: none"> • GPS satellites: Lets your phone estimate its location from satellite signals, like a GPS device in a car. • Wi-Fi & mobile network location: Lets your phone use Google Location Services to help estimate its location faster, with or without GPS. • When location access is off: <p data-bbox="464 1247 1002 1266">Your phone can't find its precise location or share it with any apps.</p> <p data-bbox="417 1278 1261 1316">Tip: If you have a tablet that more than one person uses, each person can have different location access settings.</p> <p data-bbox="358 1344 1232 1373">Attachment 40 (Manage your Pixel phone's location settings) at 3 & 4.</p>

Claim 1	Corresponding Structure in Accused Systems
	<ol style="list-style-type: none"> 1. On your Android device, go to Settings 2. Tap Location and re-enable your location services 3. Select Mode High accuracy <div data-bbox="597 365 1198 739">  </div> <div data-bbox="1208 359 1419 705"> <p>The user of the wireless device can select the method of the location estimation</p> </div> <p>On some phone models, this option can be found under the Advanced Settings option.</p> <p>Select Advanced Settings and enable your device to improve positioning accuracy by allowing apps to scan for Wi-Fi networks and Bluetooth devices at any time, even if Wi-Fi or Bluetooth is disabled.</p> <div data-bbox="597 930 1198 1310">  </div> <p>Attachment 33 (Google Maps Not Updating Location) at 4.</p>

Claim 1**Corresponding Structure in Accused Systems**

	DESCRIPTION	OPT-IN / OPT-OUT	USER CHOICES
LOCATION SERVICES	"Use Google's location service to help apps determine your location. Anonymous location data will be sent to Google when your device is on."	Opt-Out	"YES, I'M IN" or "SKIP"
LOCATION ACCURACY	Three Modes: "High accuracy", "Battery saving", and "Device only". Default setting: "High accuracy use(s) GPS, Wi-Fi, Bluetooth, or cellular networks to determine location"	Opt-Out	Toggle icon (right and colored for on, left and gray for off). This setting not shown during Android set-up.
LOCATION SCANNING	"Improve location accuracy by allowing apps and services to scan for Wi-Fi and Bluetooth, even when those settings are off."	Opt-Out	Toggle icon (right and colored for on, left and gray for off).
LOCATION HISTORY	"[A]llows Google to store a history of your location data from all devices where you are logged into your Google Account and have enabled Location Reporting. Location History and Location Reporting data may be used by any Google app or service."	Opt-Out	"YES, I'M IN" or "NO THANKS" In the context of "Give your new Assistant permission to help you"

Figure 1: Four Android settings and services that relate to location information collection.¹

Google Location Services

Google Location Services (GLS) operate at a device level and rely on sensors such as GPS, Wi-Fi, the cellular radio, and other technologies included in mobile devices to position a user in the world. If a user keeps the default settings prompted by Google, Location Services is enabled, Location Accuracy will be set to "High Accuracy"² and Location Scanning will be enabled for both Wi-Fi base stations and Bluetooth Beacons, regardless of a user's choice to turn Wi-Fi or Bluetooth on. The implications of user choices among the various Location Services settings are significant, but not intuitive, including:

- With Location Services turned on, Location Accuracy set to "Device only" and Location Scanning turned off, an Android device will only use GPS to provide the location of an Android device.
- When Location Accuracy is set to "High accuracy" and Location Scanning is enabled (the default setting for new device setup), an Android device will use sources including Wi-Fi, Bluetooth, and cellular radio to improve the accuracy of the device's position.

Attachment 38 (Google, Android and Location Tracking) at 2.

Claim 1**Corresponding Structure in Accused Systems**

After completing the setup process users can validate and control settings for device location via the Settings app and navigating to Google settings, then Location (Figure 4).

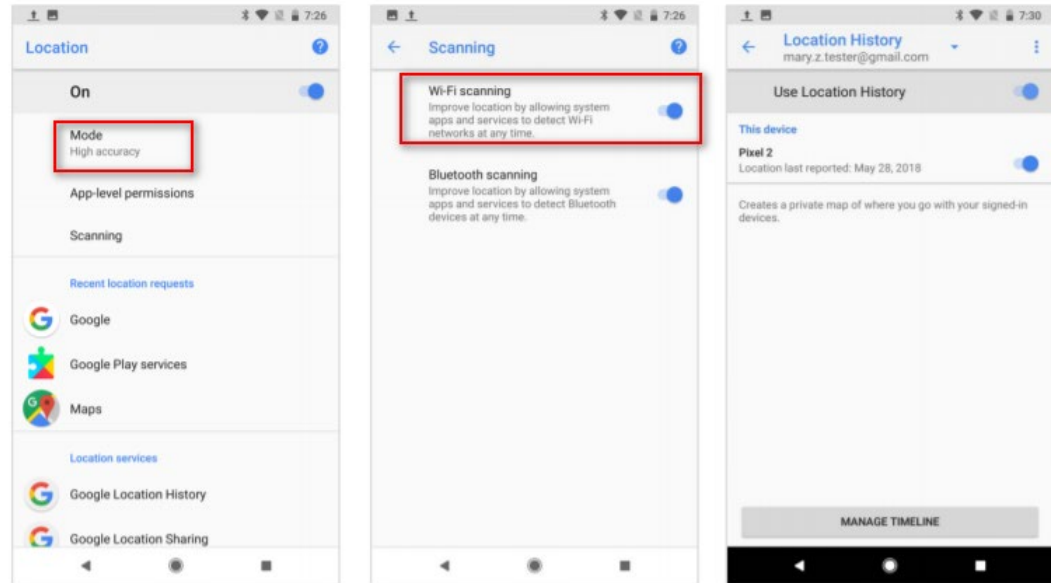
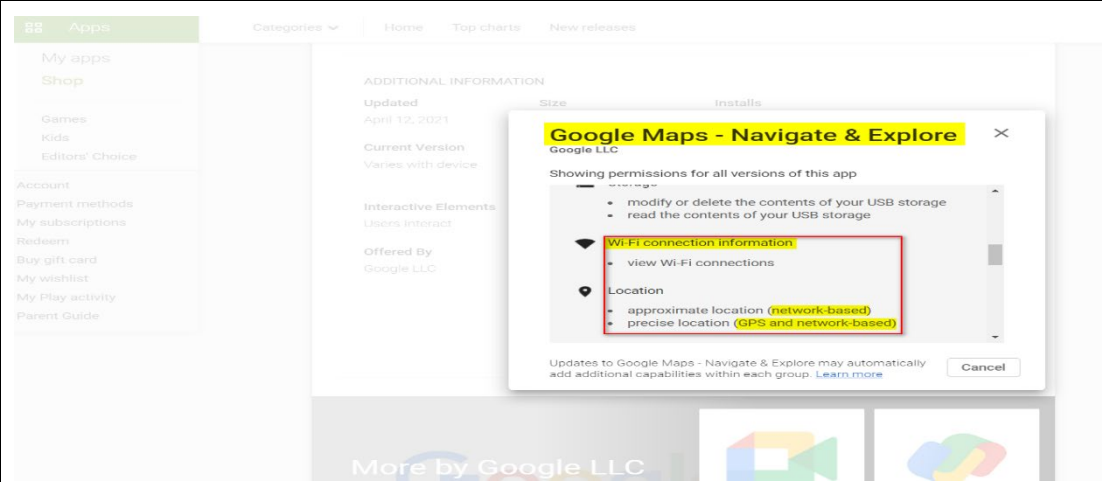


Figure 4: Location settings after Android device setup process

As demonstrated in Figure 4, if users accept Google's defaults during the setup process, the Android device is configured with Location Services enabled, Wi-Fi and Bluetooth scanning engaged, and Location History active.

Attachment 38 (Google, Android and Location Tracking) at 5.

Claim 1	Corresponding Structure in Accused Systems
	<p>Users can choose to disable GLS during the set-up process. However, if a user attempts to disable GLS, a warning dialogue box prompts an extreme scenario: “device location for all apps is turned off and you may not be able to locate your device if it is lost.” (Figure 5) Note as well, the action prompt is to “Turn on Location” – reversing the user choice triggering the warning. Further, as described immediately below, many Google and third party apps will not function unless GLS is turned on. Therefore, Google forces user into an impossible ultimatum, have their every move constantly monitored, tracked, and stored or lose the functionality of their expensive smartphone.</p> <p>If a user disables Location Services but then attempts to use a location aware app or service on their device, she will see the dialogue box shown in Figure 6. If the user clicks “OK” the service is enabled for the entire device and permanently, rather than enabling Location Services only for that particular app or service requesting the functionality.</p> <div data-bbox="513 604 828 1079" data-label="Image"> </div> <p data-bbox="516 1087 824 1108">Figure 5: Location Services Warning</p> <div data-bbox="919 604 1243 1079" data-label="Image"> </div> <p data-bbox="959 1087 1203 1129">Figure 6: Re-Enable Location Services</p> <p>Attachment 38 (Google, Android and Location Tracking) at 6.</p> <p>We collect information about your location when you use our services, which helps us offer features like driving directions for your weekend getaway or showtimes for movies playing near you.</p> <p>Your location can be determined with varying degrees of accuracy by:</p> <ul style="list-style-type: none"> • GPS • IP address • Sensor data from your device • Information about things near your device, such as Wi-Fi access points, cell towers, and Bluetooth-enabled devices <p>The types of location data we collect depend in part on your device and account settings. For example, you can turn your Android device's location on or off using the device's settings app. You can also turn on Location History if you want to create a private map of where you go with your signed-in devices.</p> <p>Attachment 29 (Google Privacy Policy) at 4.</p>

Claim 1	Corresponding Structure in Accused Systems
	<div></div> <p>Attachment 39 (Google Map_Permissions) at 1.</p>

27.

28. Defendant makes, uses, offers to sell, and/or sells within or imports into the U.S., wireless-network components and related applications and programs, and related services that use identified locations of wireless devices to provide tracking such that Defendant infringes claims 1–24 of the '147 patent, literally or under the doctrine of equivalents.
29. Defendant put the inventions claimed by the '147 Patent into service (i.e., used them); but for Defendant's actions, the claimed-inventions embodiments involving Defendant's products and services would never have been put into service. Defendant's acts complained of herein caused those claimed-invention embodiments as a whole to perform, and Defendant obtaining monetary and commercial benefit from it.
30. Defendant has and continues to induce infringement. Defendants have actively encouraged or instructed others (e.g., its customers, such as Verizon, T-Mobile and Sprint), and continues to do so, on how to use its products and services (e.g., wireless-network components and related applications and programs that use identified locations of wireless devices to provide tracking of mobile devices) such to cause infringement claims 1–24 of the '147 patent, literally or under the doctrine of equivalents. Moreover, Defendant has known and should have known of the '147 patent, by at least by the date of the patent's issuance, or from the issuance of the '284 patent, which followed the date that the patent's underlying application was cited to Defendants by the U.S. Patent and Trademark Office during prosecution of one of Defendant's patent applications, such that Defendant knew and should have known that it was and would be inducing infringement.
31. Defendant has and continues to contributorily infringe. Defendant has actively encouraged

or instructed others (e.g., its customers and/or the customers of its related companies, such as Verizon, T-Mobile and Sprint), and continues to do so, on how to use its products and services e.g., wireless-network components and related applications and programs that use identified locations of wireless devices to provide tracking of mobile devices) such as to cause infringement of one or more of claims 1–24 of the '147 patent, literally or under the doctrine of equivalents. Moreover, Defendant has known of the '147 patent and the technology underlying it from at least the date of issuance of the patent or from the issuance of the '284 patent, which followed the date that the patent's underlying application was cited to Defendants by the U.S. Patent and Trademark Office during prosecution of one of Defendant's patent applications, such that Defendant knew and should have known that it was and would be contributorily infringing.

32. Defendants have caused and will continue to cause Traxcell damage by infringing the '147 patent.

VI. PRAYER FOR RELIEF

WHEREFORE, Traxcell respectfully requests that this Court:

- i. enter judgment that Defendants have infringed the Patents-in-Suit;
- ii. award Traxcell damages in an amount sufficient to compensate it for Defendants' infringement of the Patents-in-Suit, in an amount no less than a reasonable royalty, together with prejudgment and post-judgment interest and costs under 35 U.S.C. § 284;
- iii. award Traxcell an accounting for acts of infringement not presented at trial and an award by the Court of additional damage for any such acts of infringement;
- iv. declare this case to be "exceptional" under 35 U.S.C. § 285 and award Traxcell its attorneys' fees, expenses, and costs incurred in this action;
- v. declare Defendants infringement to be willful and treble the damages, including attorneys'

fees, expenses, and costs incurred in this action and an increase in the damage award pursuant to 35 U.S.C. §284;

- vi. a decree addressing future infringement that either (i) awards a permanent injunction enjoining Defendants and their agents, servants, employees, affiliates, divisions, and subsidiaries, and those in association with Defendants, from infringing the claims of the Patents-in-Suit or (ii) award damages for future infringement in lieu of an injunction, in an amount consistent with the fact that for future infringement the Defendants will be adjudicated infringers of a valid patent, and trebles that amount in view of the fact that the future infringement will be willful as a matter of law; and,
- vii. award Traxcell such other and further relief as this Court deems just and proper.

JURY DEMAND

Traxcell hereby requests a trial by jury on issues so triable by right.

Respectfully submitted,

Ramey & Schwaller, LLP

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